IPC Series

BOX-PC
IPC-BX/600(PCW),
IPC-BX/600(PCW)C,
IPC-BX/600(PCW)CP,
IPC-BX/600(PCW)C4P
User's Manual

CONTEC CO.,LTD.

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1. Introduction

CONTEC has been actively engaged in the development of software that is indispensable to the optimization of systems and for factory automation. Recent years have seen an increasing number of users who embrace FA and LA utilizing personal computers. In response to this trend, CONTEC has developed and marketed FA computers (the IPC series) and a variety of interface boards.

The BOX-PC is a compact FA computer loaded with every function needed. The following four models are available:

Basic Model

IPC-BX/M600(PCW)

Model with PCMCIA Card and Panel Link I/F

IPC-BX/M600(PCW)C

Model with PCMCIA Card, Panel Link I/F and Expansion Slot

IPC-BX/M600(PCW)CP (Expansion 2 slots)
IPC-BX/M600(PCW)C4P (Expansion 4 slots)

Features

- Equipped with the latest Low Power Celeron 400MHz CPU
- Fan-less operation achieved by natural air-cooling
- Ten-year long-life power supply at an ambient temperature of 40°C
- Long, reliable supply (The CPU and chip set are embedded versions.)
- Adoption of BIOS (Phoenix Technologies, Ltd.) customized by CONTEC to support the BIOS level
- Equipped with 100BASE-TX LAN standard
- Equipped with a secondary-IDE connector to allow an optional external CD-ROM to be connected
- Equipped with a Panel Link I/F in addition to CRT I/F (C, CP, C4P model)

Compatible Operating Systems

- Windows 2000 Professional
- Windows NT 4.0 Workstation
- Windows 98 Second Edition

Limited One-Year Warranty

CONTEC Interface boards are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

*** No product will be accepted by CONTEC group without the RMA number.**

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Handling Precautions

Take the following precautions when handling this product.

- Do not use or store the product in a location exposed to extremely high or low temperature or susceptible to rapid temperature changes.
  Example: - Exposure to direct sun
  - In the vicinity of a heat source
- Do not use the product in extremely humid or dusty locations. It is extremely dangerous to use the product with its interior penetrated by water or any other fluid or conductive dust. If the product must be used in such an environment, install it on a dust-proof control panel, for example.
- Avoid using or storing the device in locations subject to shock or vibration.
- Do not use the product in the vicinity of devices that generate strong magnetic force or noise. Such devices will cause this device to malfunction.
- Do not use or store the product in the presence of chemicals.
- The lower center of the left face (seen from the connector's front surface) may become hot. To avoid being burned, do not touch that section while the product is in operation or immediately after turning off the power. Avoid installation in a location where people may come into contact with that section.
- To clean the BOX-PC, wipe it gently with a soft cloth dampened with either water or mild detergent. Do not use chemicals or a volatile solvent, such as benzene or thinner, to prevent pealing or discoloration of the paint.
- When you need to continually operate the device using the hard disk, be sure to run the HDD in standby mode. Running in other than standby mode significantly shortens the product's life. (For more information, see form titled "Precautions" that comes with the optional product [2.5inch HDD.])
- Before installing or uninstalling an expansion board (the CP model) or connecting or disconnecting a connector, be sure to unplug the power cable from the wall outlet.
- CONTEC reserves the right to refuse to service a product modified by the user.

- In the event of failure or abnormality (foul smells or excessive heat generation), unplug the power cord immediately and contact the sales representative you purchased the product from or the CONTEC Information Center.
- Use an AC cable that is compatible with both the rated supply voltage and the receptacle. (The cable provided with the product is for 125VAC.)
- Component Life:

1. Power supply--- Estimated life is about 10 years based on continual operation at 40°C (horizontal installation). However, (higher) operating temperatures will result in shorter life.

2. Battery--- The internal calendar clock and CMOS RAM are backed by a Lithium primary battery. The backup time at a temperature of 25°C with the power disconnected is 10 years or more.

* Replacement of expendables is handled as a repair (there will be a charge).

FCC PART 15 Class A Notice

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

Note!

To connect with peripherals, use a grounded, shielded cable.

About the Manual

This manual consists of the following chapters:

Chapter 1 Introduction

Chapter 2 Overview

Chapter 3 Hardware Setup

Chapter 4 BIOS Setup

Chapter 5 Each Component Function

Chapter 6 Appendix

Chapter 7 List of Options

2. Overview

Specifications

Table 2.1. Functional Specifications

Model		IPC-BX/M600(PCW)	IPC-BX/M600(PCW)C	IPC-BX/M600(PCW)CP	IPC-BX/M600(PCW)C4P
CPU		Low Power Mobile Celeron 400MHz, FSB100MHz(Intel)			
Chip set		Intel 440BX			
Memory	L2 Cache	128KB			
	Main memory	Max. 256MB 3.3V 144pin SO-DIMM Socket x 2 (Memory capacity choices: 64MB or 128MB <each uses 1 socket> or 256MB <uses 2 sockets>)			
	BIOS ROM	128KB E0000H to FFFFFH (Phoenix)			
Video	Controller	B69000(C&T)			
	Video RAM	2MB (Built into the controller)			
	Video BIOS	48KB (C0000H to CBFFFF)			
	CRT I/F	15pin HD-SUB connector			
	Panel Link I/F	Not available	Dedicated 20pin, half-pitch connector *1		
FDD I/F		Equipped with a dedicated 26pin, half-pitch connector: 2 modes (Optional FDD: PC-FDD25BH)			
IDE HDD I/F	Primary	2.5inch IDE-HDD or silicon disk can be added.			
	Secondary	Equipped with a dedicated 40pin, half-pitch connector (for connection of an optional CD-ROM) (right surface)			
Serial I/F *2		RS-232C(general-purpose): 2ch (SERIAL PORT1,2) 9pin, D-SUB connector RS-232C(touch panel): 1ch (SERIAL PORT3) [inside the Panel Link connector] *1 RS-422/485(general-purpose): 1ch (SERIAL PORT4) [inside the RAS connector]			
Parallel I/F *2		Bi-directional, Centronics-compliant, 25pin D-SUB connector			
LAN	I/F	Ethernet 100BASE-TX/10BASE-T RJ-45 connector			
	Controller	Intel 82559			
PC card slot *2		None	PCMCIA Type I, II x 2 or III x 1 (Startup from ATA card not allowed)		
USB I/F		2ch (USB 1.1)			
Keyboard I/F		PC/AT keyboard-compatible (6pin, MINI DIN connector)			
Mouse I/F		PS/2-type mouse-compatible (6pin MINI DIN connector)			
General-purpose I/O		3 opto-capler isolated inputs and outputs (However, one output also serves as an external WDT output and one input also serves as remote reset. They become available when switched.)			
RAS function		WDT: 244.14µsec to 255sec (RESET or external output is allowed at time expiration) Remote reset: External input signal			
Expansion board slot *2		None		Shared PCI/ISA slot x 2, Installable board length: 24mm Max.	Shared PCI/ISA slot x 2, PCI slot x 2, Installable board length: 24mm Max.
RTC/CMOS		Lithium backup battery life: 10 years or more			
Power supply	Input supply voltage	100 to 120VAC/200 to 240VAC 50/60Hz 1.8/0.8A			
	Current consumption	42VA (Max.)		80VA(Max.)	104VA(Max.)
	Expansion board power-supply capacity	None		+5V: 2A(1A x 2 slots), -5V: Not supplied +12V: 0.5A, -12V: 80mA	+5V: 4A(1A x 4 slots), -5V: Not supplied +12V: 0.5A, -12V: 80mA
External dimensions (mm)		262(W) x 262(D) x 55(H)		262(W) x 262(D) x 115(H)	
Weight		Approx. 3.3 kg		Approx. 4.2 kg	Approx. 5.0 kg

*1 Used with a display installed with a touch panel of Contec panel-linkage specifications.

*2 Not all functions can be used simultaneously due to a limit on the number of interrupt resources.

Table 2.2. Installation Environment Requirements

Parameter			Requirement description
Power supply specifications			
	Allowable instantaneous power outage		Less than 20ms
	Dielectric strength		One minute each for 3.0 kVAC (input-output), 2.0 kVAC (input-FG), and 0.5 kVAC (output-FG)
	Insulation resistance		50MΩ (DC500V)
Ambient specifications			
	Operating temperature		0 to 50ºC(SDD in use)
			0 to 45ºC(HDD in use)
			5 to 45ºC(FDD in use)
	Storage temperature		-10 to 60ºC
	Humidity *1		10 to 90%RH(No condensation)
	Floating dust particles		Not to be excessive
	Corrosive gases		None
	Line-noise resistance	Line noise	AC line/2kV, Signal line/1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
		Static electricity resistance	Contact discharge/4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2)
			Atmospheric discharge/8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
	Vibration resistance *2	Sweep resistance	10 to 50Hz/semi-amplitude 0.15mm 50 to 500Hz/2.0G 23 min. each in x, y, and z directions (JIS C0040-compliant, IEC68-2-6-compliant)
		Fixed-vibration resistant	30 min. each in x, y, and z directions (JIS C0040-compliant, IEC68-2-6-compliant)
	Impact resistance *2		10G, half-sine shock for 11 ms in x, y, and z directions (JIS C0041-compliant, IEC68-2-27-compliant)
	Grounding		Class D grounding (previous class 3 grounding)

*1 When a floppy disk is not in use.

*2 When the HDD and FDD are not in use.

System Configuration

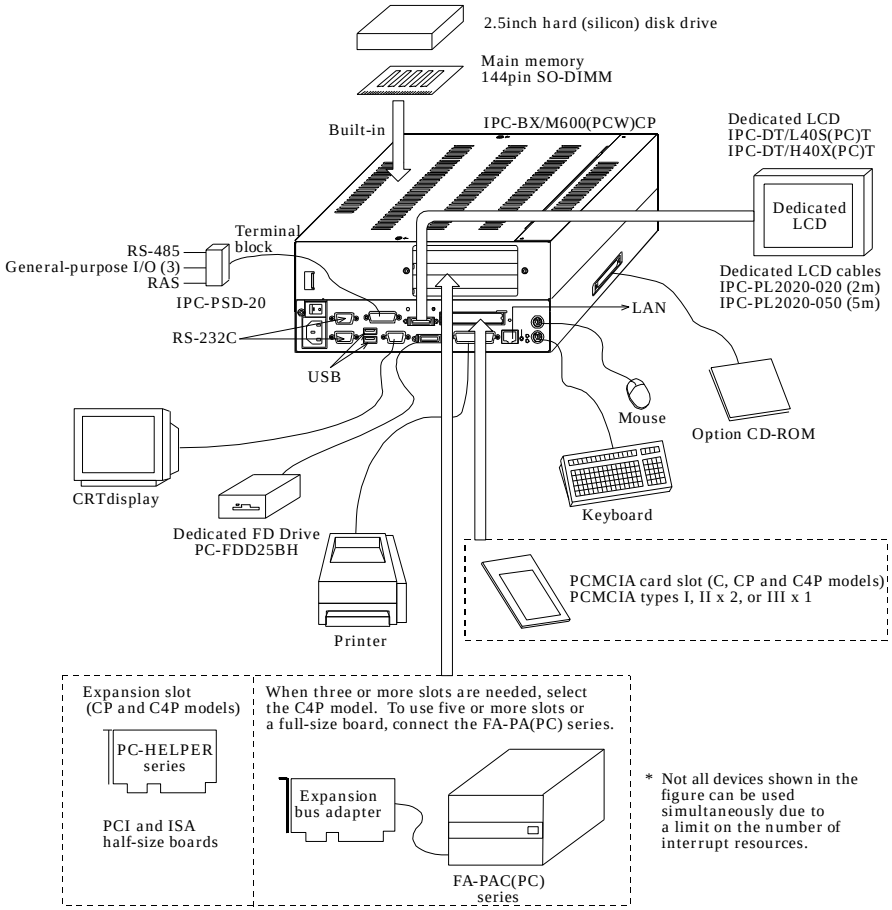


Figure 2.1. System Configuration

External Dimensions

IPC-BX/M600(PCW)

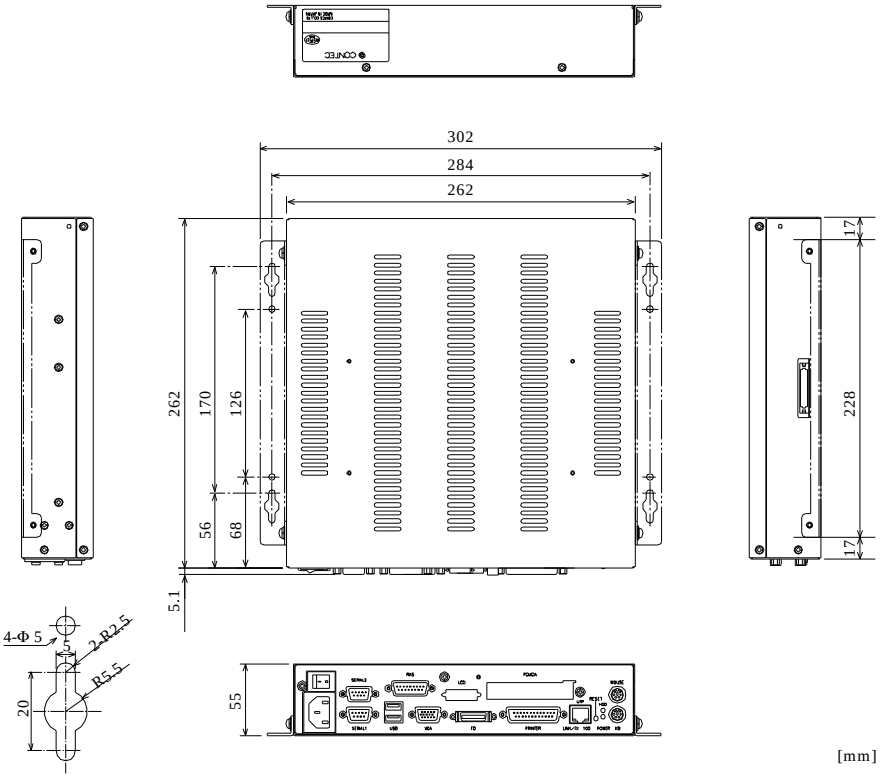


Figure 2.2. IPC-BX/M600(PCW)

Note!

The panel link interface and PC card connector are not installed on the IPC-BX/M600(PCW).

IPC-BX/M600(PCW)C

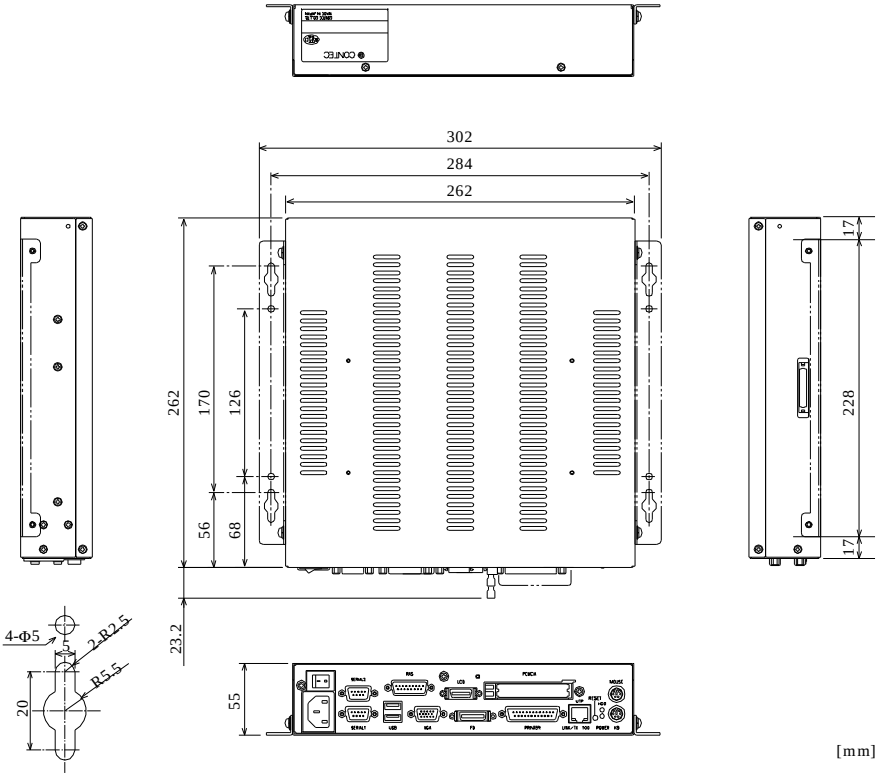


Figure 2.3. External Dimensions of the IPC-BX/M600(PCW)C

IPC-BX/M600(PCW)CP

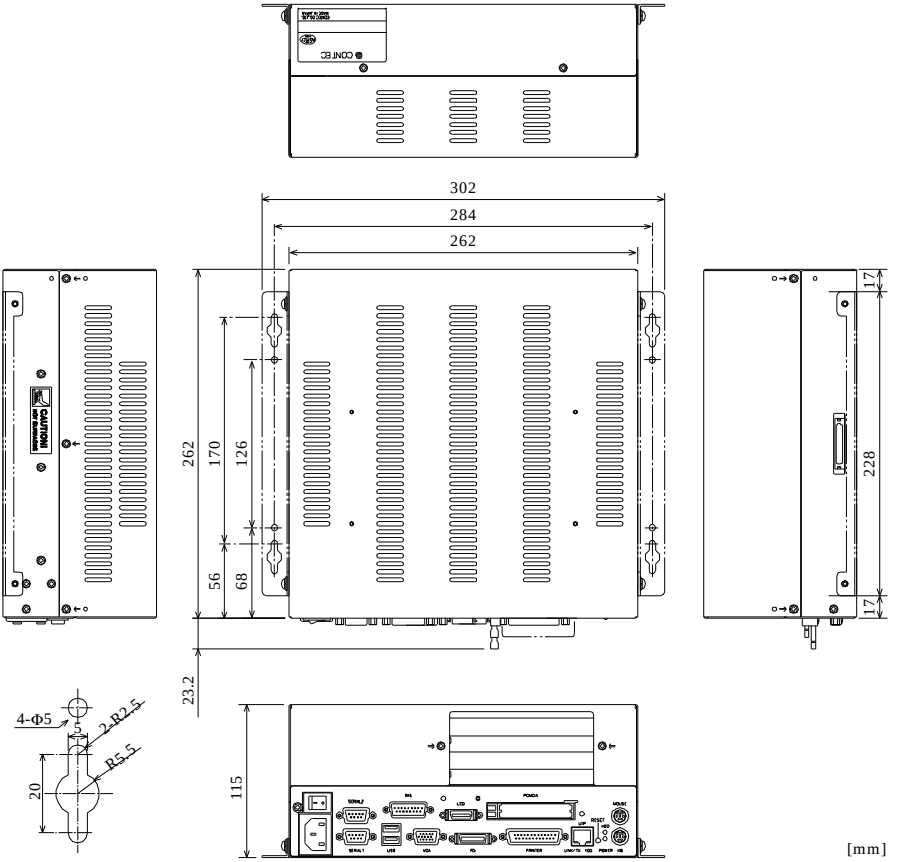


Figure 2.4. External Dimensions of the IPC-BX/M600(PCW)CP

IPC-BX/M600(PCW)C4P

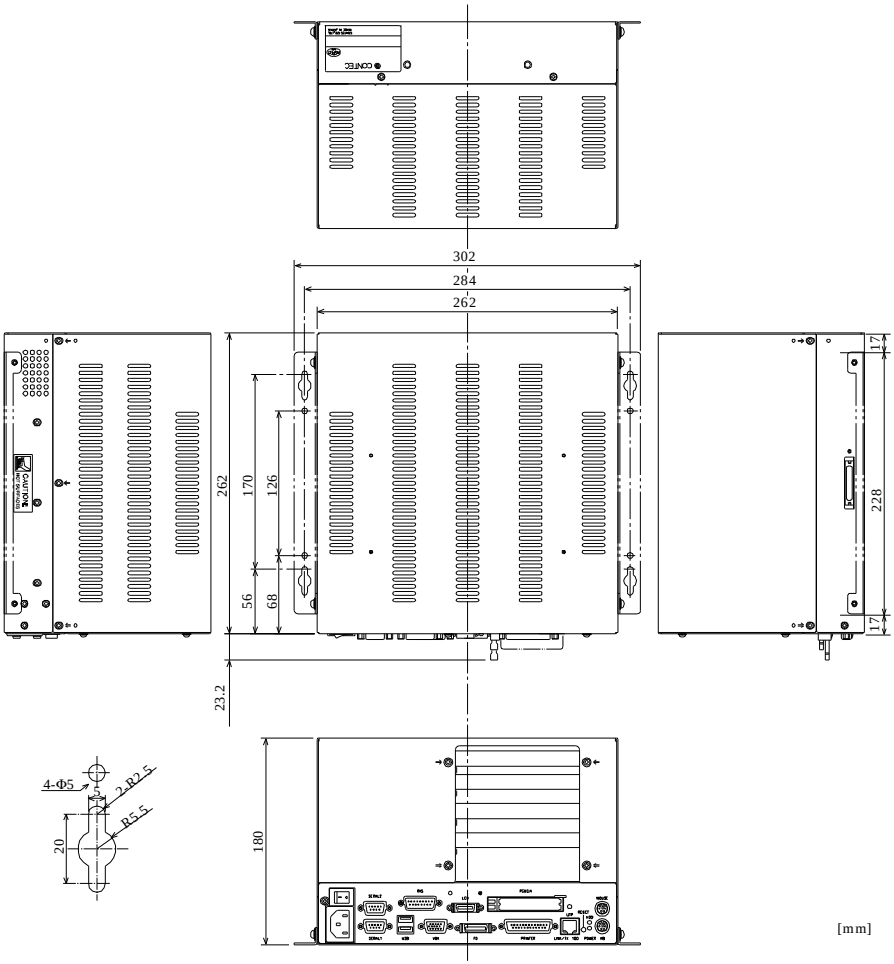


Figure 2.5. External Dimensions of the IPC-BX/M600(PCW)C4P

3. Hardware Setup

Before Using the BOX-PC for the First Time

Follow the next steps to set up the BOX-PC:

STEP1 Install the hard disk and expansion main memory (DIMM) and set jumper switches.
By referring to the information in this chapter, set the BOX-PC.

STEP2 Connect cables.
Connect necessary external devices, such as a printer and a CRT, to the BOX-PC using appropriate cables.

STEP3 Turn on the power.
After verifying that you have correctly followed steps 1 and 2, turn on the power. If you feel something is wrong after turning on the power, turn off the power immediately and check to see if the BOX-PC has been set up correctly.

STEP4 Set up BIOS.
By referring to Chapter 4, set up BIOS. This setup requires a keyboard and a display.

* Before using the BOX-PC, be sure to execute " LOAD SETUP DEFAULTS" to initialize the BIOS settings to their default values.
(See Chapter 4, "Main Menu.")

Note!

If Windows is pre-installed, always connect the keyboard and mouse before turning on the power for the first time.

Hardware Setup

Removing the Top Cover and HDD Bracket

- Before you start, be sure that the power is turned off.
- Remove only those screws that are explained. Do not move any other screw.

(1) Remove the top cover.

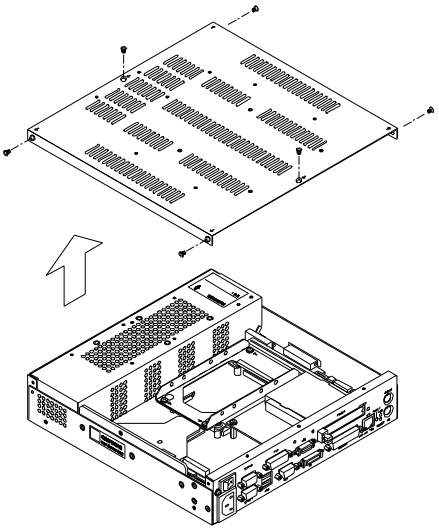


Figure 3.1. Removing the Top Cover

(2) Remove the hard disk bracket.

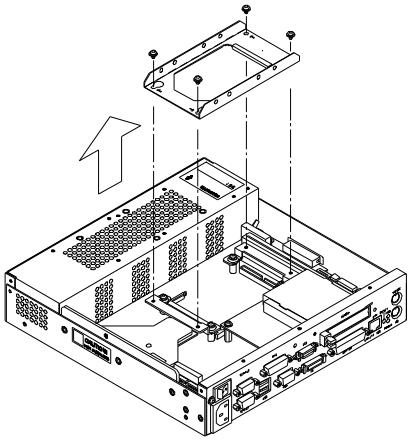
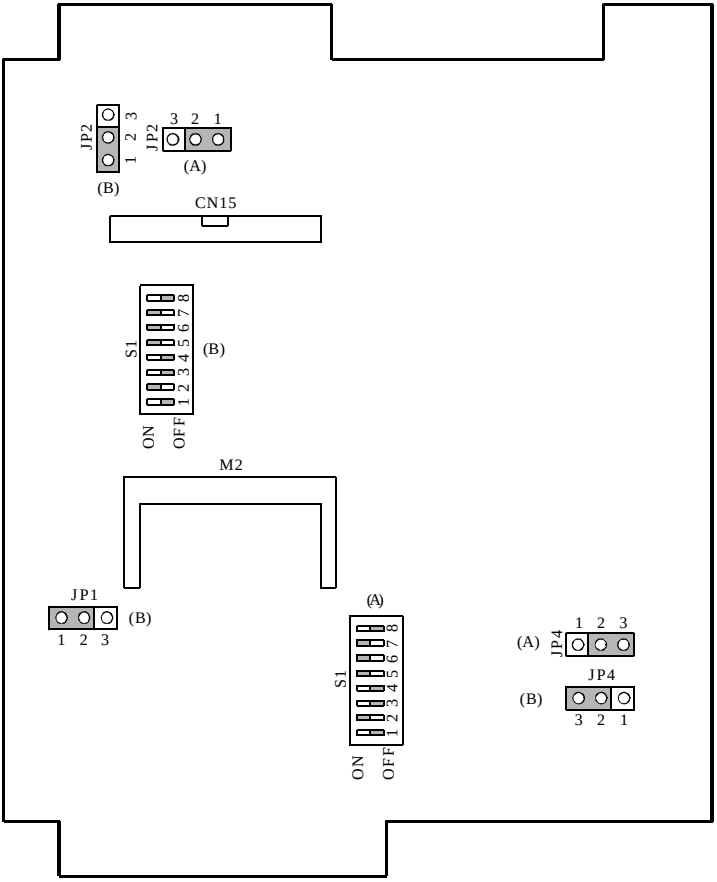


Figure 3.2. Removing the HDD Bracket

Locations and Settings of Internal Connectors and Jumpers

When you remove the top cover and hard disk bracket, the connectors, jumpers, and switches are laid out as shown in the figure below:



* The position of the jumpers mounted changes with kinds (A, B) of substrate.
JP1 is not mounted by A type.

Figure 3.3. Locations and Settings of Jumpers, Connectors, and Switches inside the Top Cover

Table 3.1. Jumper List

No.	Function	Factory setting	Reference page	Remarks
JP1	- Selects BUS clock scale.	1-2 shorted	---	Settings other than 1-2 are not allowed.
JP2	- Clear CMOS.	1-2 shorted	---	Short 2-3 to clear CMOS.
JP4	- Sets RS-485 termination.	2-3 shorted	55	
S1	- Sets destination where BIOS setup details will be saved. - Sets up LCD.	1, 3, 4, and 8 OFF 2, 5, 6, and 7 ON	45 76	

Table 3.2. Internal Connector List

Connector	Function	Reference page
CN15	Primary IDE connector (44pin, pin header)	81
M2	Expansion memory set (3.3V, 144pin SO-DIMM)	22

Installing the Hard Disk

(1) Connect the provided HDD cable to the hard disk (silicon disk).

Note!

Connect the HDD cable in alignment with pins from the left end of the connector on the HDD side.
Four master/slave setting pins are left unconnected on the right side. Be aware that connecting the power with the connector misaligned will damage the cable.

(2) By threading the cable through the hole on the base of the hard disk bracket, fasten the disk to its bracket using four screws.

- Use the upper screw holes of the hard disk bracket.
- Fasten the disk using the outer or inner hole depending on the model you are using. (The figure below shows an example that uses the inner screw hole.)

(3) Connect the HDD cable to CN15 on the unit and fasten the hard disk bracket to the unit using four screws.

(4) Close the top cover and secure it with screws.

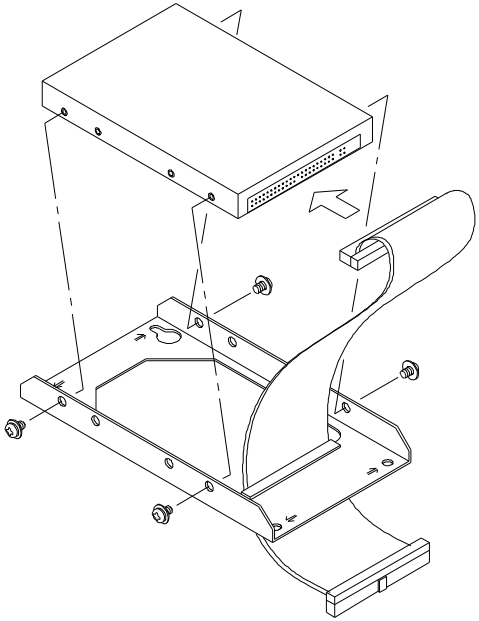


Figure 3.4. Installing the Hard Disk

Installing the Main Memory (DIMM)

Compatible DIMM Types

Obtain the following special option products.

- Package type : 144-pin, small outline DIMM
- Specifications : 3.3V, PC100/CL2
- Capacity : 64MB / 128MB
- Type : SDRAM
- Optional memories * : 64MB : PC-MSD64-144H
  128MB : PC-MSD128-144H

* Operation is not guaranteed if memory parts other than CONTEC option products are used.

Main Memory (DIMM) Installation Procedure

Follow the next steps to fit the memory into the DIMM socket:

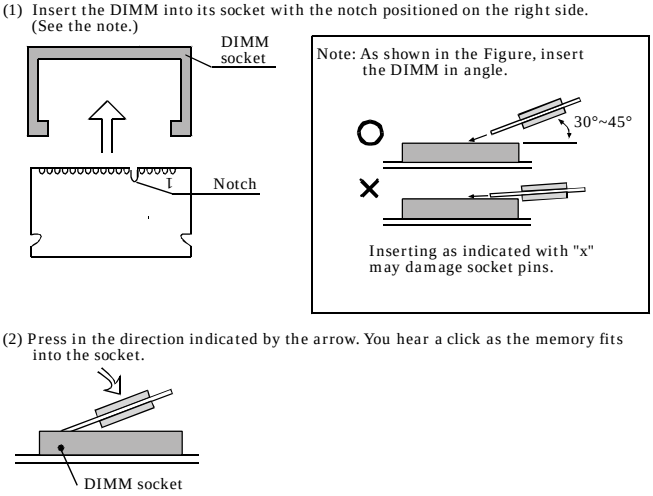

(1) Insert the DIMM into its socket with the notch positioned on the right side.
(See the note.)
DIMM socket
Notch
Note: As shown in the Figure, insert the DIMM in angle.
30°~45°
Inserting as indicated with "x" may damage socket pins.
(2) Press in the direction indicated by the arrow. You hear a click as the memory fits into the socket.
DIMM socket

Figure 3.5. Installing the DIMM

DIMM Disconnection Procedure

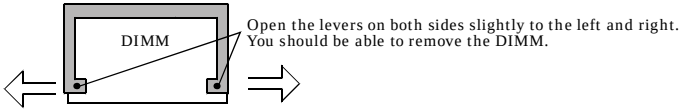


Figure 3.6. Uninstalling the DIMM

Fastening the Power Cable

Removing the Screw on the Metal Brace to Keep the AC Cord in Place

In order to install the metal brace, temporarily remove the machine screw on the front left end.

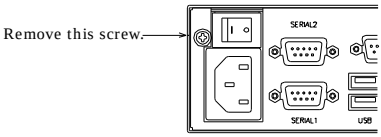


Figure 3.7. Removing the Screw

Installing the AC Cord Metal Brace and the Clamp

Insert the AC cord all the way into the inlet. Fasten the AC cord metal brace using the screw you removed earlier. Attach the clamp to an appropriate location on the metal brace to clamp the cord. The “AC cord metal brace” is attached to the main case.

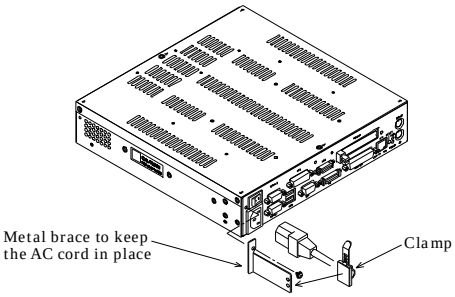


Figure 3.8. Installing the Metal Brace and the Clamp

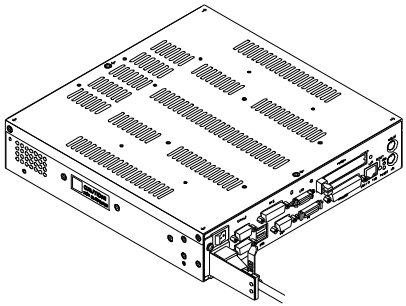


Figure 3.9. AC Cord in Clamped State

Installation Requirements

The BOX-PC can be installed in any orientation (1) through (5). Avoid orientation (6) since it might not adequately dissipate heat. Similarly, to maintain the ambient temperature within the range specified in the specifications, ensure a clearance between the unit and surrounding equipment of at least 100mm for the top and rear and 50mm for the bottom and sides.

Installation Orientation

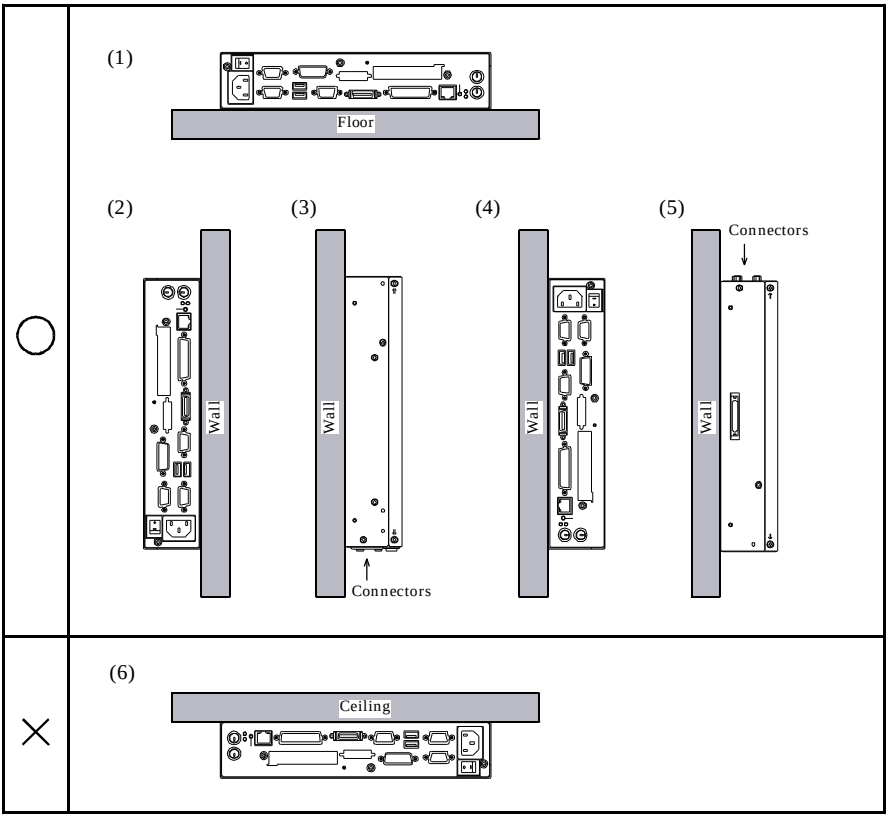


Figure 3.10. Installation Orientation

Distances between the BOX-PC and Its Vicinity

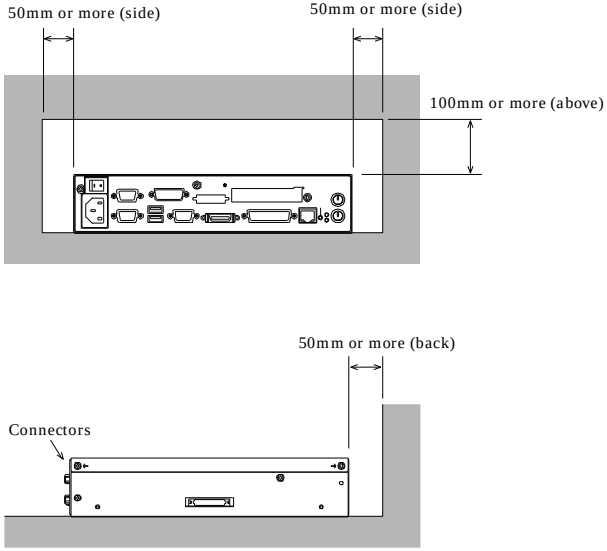


Figure 3.11. Distances between the BOX-PC and Its Vicinity

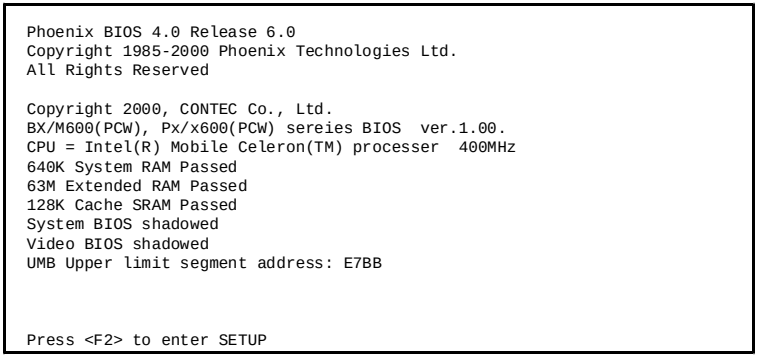
4. BIOS Setup

BIOS Setup

BIOS setup sets various settings during startup. When using the system for the first time, be sure to run BIOS setup. Once set up, the specified details will be backed up.

Starting the Setup Screen

When you turn on the system, it displays "Press <F2> to enter SETUP" if the system is normal. Press the <F2> key on the keyboard.


Phoenix BIOS 4.0 Release 6.0
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Copyright 2000, CONTEC Co., Ltd.
BX/M600(PCW), Px/x600(PCW) sereies BIOS ver.1.00.
CPU = Intel(R) Mobile Celeron(TM) processer 400MHz
640K System RAM Passed
63M Extended RAM Passed
128K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
UMB Upper limit segment address: E7BB
Press <F2> to enter SETUP

Figure 4.1. Initial Screen

Keystrokes

The following is a list of major key functions you can use during BIOS setup:

Table 4.1. Key Function List

Key to press	Function
→, ←	Moves the main menu.
↑ , ↓	Moves between items to be set.
<Tab>	Moves within items to be set.
<Shift>+<Tab>	Moves in the direction opposite to <Tab>.
<Spacebar>	Changes details to be set.
+	Functions the same as <Spacebar>.
-	Changes in the direction opposite to the + key.
<Enter>	Opens submenus.
<Esc>	Moves to the Exit window.
<F9>	Resets all to defaults.
<F10>	Saves set values and exits setup.

Main Menu

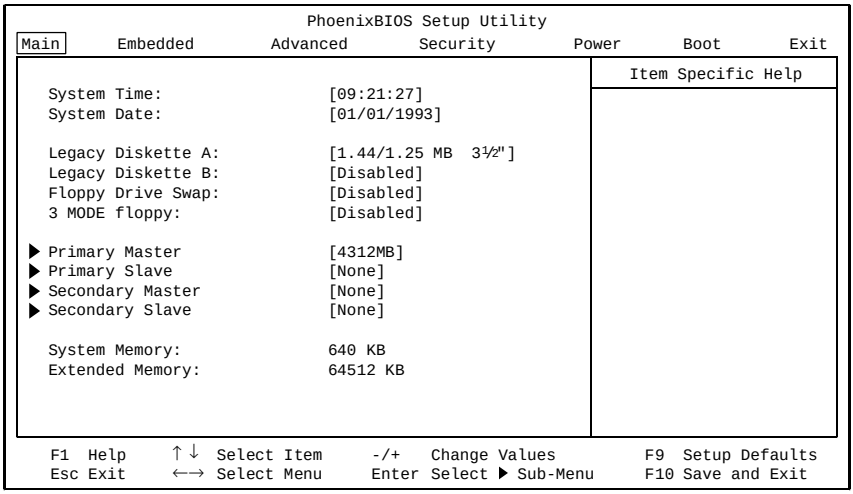


Figure 4.2. Main Window (Factory Settings)

System Time	:	Sets the time on the equipment calendar clock.
System date	:	Sets the date on the equipment calendar clock.
Diskette A	:	Specify the type of FDD to be used as drive A. If you are not using the FDD, set to "Disabled." Do not set to "2.88MB" since it is not supported.
Diskette B	:	Connection not allowed. Set to "Disabled."
Floppy Drive Swap	:	Set to "Disabled."
3 Mode floppy	:	Set to "Disabled."

Primary Master	:	Set the type of HDD to be used as the first drive. If you are not using the HDD, set to "None." Select "Auto" setup to make setting easier.
Primary Slave	:	Connection not allowed. Set to "None."
Secondary Master	:	Normally, connection is not allowed. Set only when you set the PCMCIA connector's ATA disk to secondary or when you connect an external CD-ROM.
Secondary Slave	:	Connection not allowed. Set to "None."

IDE Adapter Window

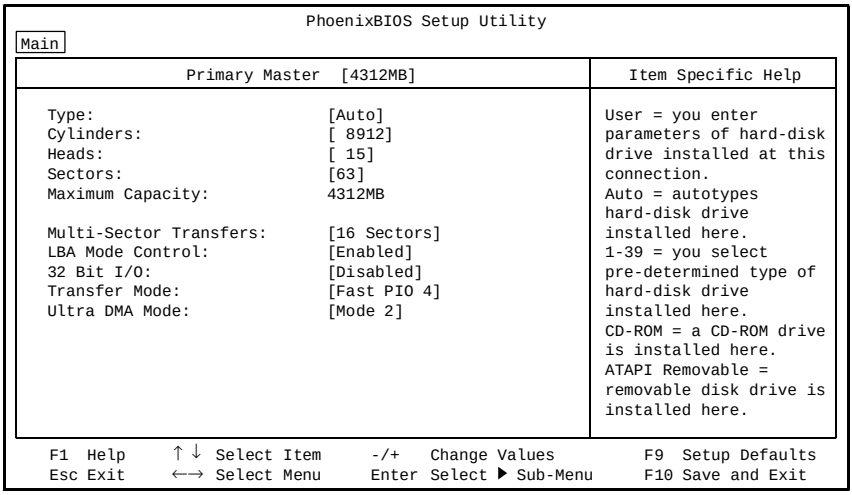

PhoenixBIOS Setup Utility
Main
Primary Master [4312MB]
Item Specific Help
Type: [Auto]
Cylinders: [8912]
Heads: [15]
Sectors: [63]
Maximum Capacity: 4312MB
Multi-Sector Transfers: [16 Sectors]
LBA Mode Control: [Enabled]
32 Bit I/O: [Disabled]
Transfer Mode: [Fast PIO 4]
Ultra DMA Mode: [Mode 2]
User = you enter parameters of hard-disk drive installed at this connection.
Auto = autotypes hard-disk drive installed here.
1-39 = you select pre-determined type of hard-disk drive installed here.
CD-ROM = a CD-ROM drive is installed here.
ATAPI Removable = removable disk drive is installed here.
F1 Help ↑ ↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Figure 4.3. IDE Adapter Window (Factory Settings)

Type	:	Set to "Auto" to use the primary master. Otherwise set to "None."

Embedded Window

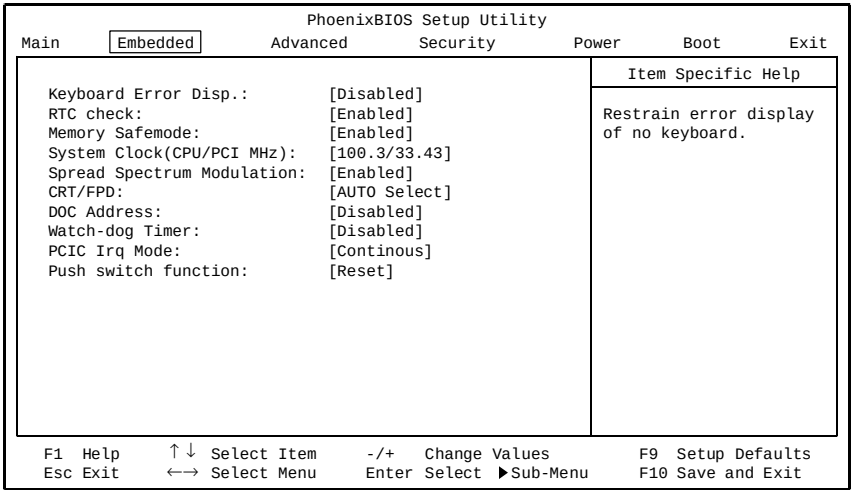


Figure 4.4. Embedded Window (Factory Settings)

Keyboard Error Disp. : Specify whether or not to display errors when no keyboard is used.

RTC check : Specify whether or not to display time errors when the RTC backup battery is depleted.

Memory Safemode : Set to Enable.

System Clock(CPU/PCI MHz) :
Set the system clock. Normally, set to "100.3/33.43." However if you are concerned with heat dissipation, for example, set to "66.8/33.40."

Spread Spectrum Modulation : Set to Enable.

CRT/FPD : Specify the display type. Choose from "CRT Only," "AUTO Select," "SW Select," "VGA TFT," "SVGA TFT," and "XGA TFT." When you are using only a CRT, select "CRT." For others, set to "AUTO Select."

AUTO Select:
It automatically recognizes the type of FPD with COM-port signals on the FPD signal when PC startups. In case of not connecting FPD to BOX-PC or not turning on FPD, it will be CRT-Mode. Also FPD will not be displayed.

CRT Only:
Select this option to use only a CRT.

SW Select:
Select this option to follow the S1 settings.

SVGA TFT:
800×600 TFT(IPC-DT/L40S(PC)T) only. This option overrides the SW settings.

XGA TFT:
1024×768 TFT(IPC-DT/H40X(PC)T) only. This option overrides the SW settings.

VGA TFT:
Currently, there is no panel link display available that corresponds to the 640 x 480 TFT.

DOC Address : Set to "Disabled".

Watch-dog Timer: Specify the output status of the RAS connector (PO2/WDT) signal during BIOS startup.

Disable:
Sets the RAS connector's

PO2/WDT(12) signal to PO2 (general-purpose output).

Enable:
Sets the RAS connector's PO2/WDT(12) signal to Alarm Out. Alarm out status at BIOS startup should be set with the submenu.

PCIC Irq Mode : Set to "Continous".

Push switch function : Set to "Reset".

Advanced Window

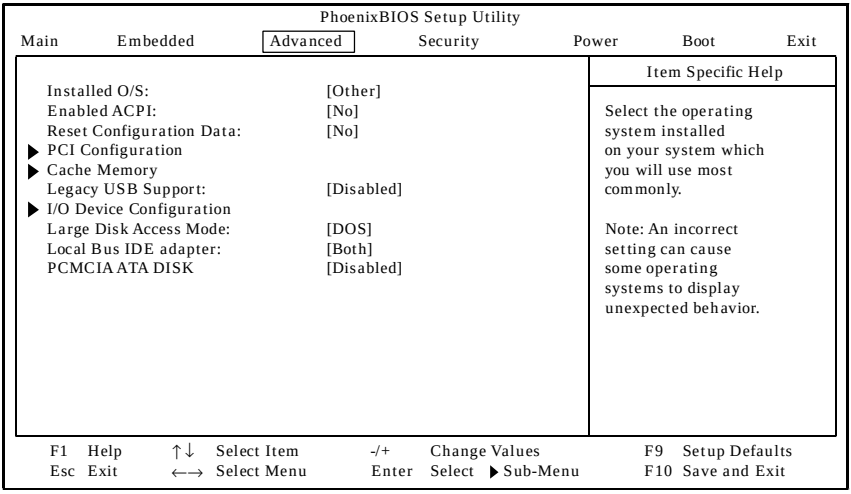


Figure 4.5. Advanced Window (Factory Settings)

Installed OS : Normally, set to "Other."

Enabled ACPI : Set to "No".

Reset Configuration Data: Resets the resources assigned to the PCI and PnP devices.
Before installing the OS, set “Yes” to reset the configuration. The setting automatically returns to “No” after rebooting.

PCI Configuration : Allows resources to be reserved for legacy devices.

Cache Memory : Specify whether to enable or disable cache memory.

Legacy USB Support : Set to "Disabled."

I/O Device Configuration: Set COM/LPT.

Large Disk Access Mode : Normally, set to "DOS."

Local Bus IDE adapter * : Sets the on-board IDE controller.

PCMCIA ATA DISK * : Specify when the ATA card needs to be booted. Ensure that the setting does not collide with a local IDE controller. ATA card boot cannot be used in Windows, for example.

* As to the local bus IDE adapter and the PCMCIA ATA DISK, a combined total of two units can be used at maximum.

PCI Configuration Window

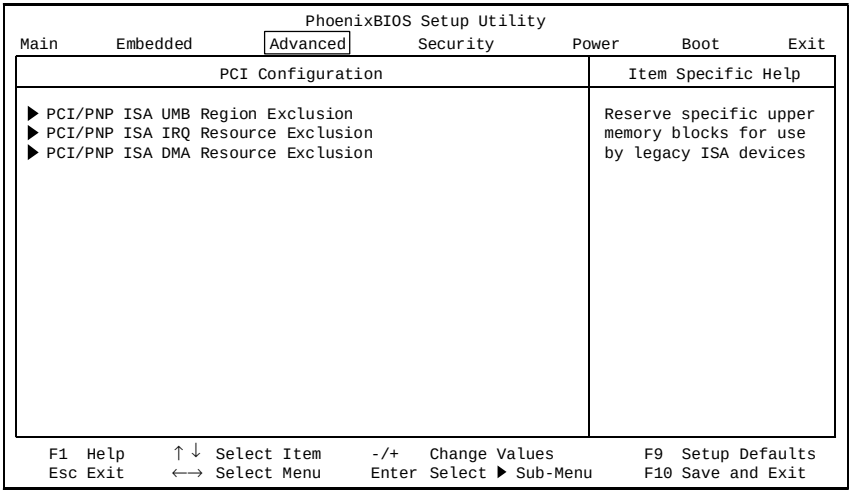


Figure 4.6. PCI Configuration Window

PCI/PNP ISA UMB Region Exclusion

: When using a board installed with a ROM for ISA, set the address that board will be using to Reserved. * (Unless a problem occurs, this setting does not need to be modified.)

PCI/PNP ISA IRQ Resource Exclusion

: Set the IRQ which ISA will be using to Reserved. Set the IRQ which you have specified manually by selecting Enable in the I/O Device Configuration window to Available. In addition, set one IRQ which a PCI device will be using to Available. (See the Note below)

PCI/PNP ISA DMA Resource Exclusion

: When using a DMA board for ISA, set the DMA channel that board will be using to Reserved.

* Do not set all of these resources to “Reserved”, or BIOS Setup will be unable to be invoked. If they are all set so, the CMOS RAM must be cleared (by setting the JP2).

Note!

As IRQ11 is reserved for PCI devices, this setting should always be fixed to “Available”.
Do not use this interrupt(IRQ11) for ISA devices or internal peripherals (such as the COM ports).

Cache Memory Window

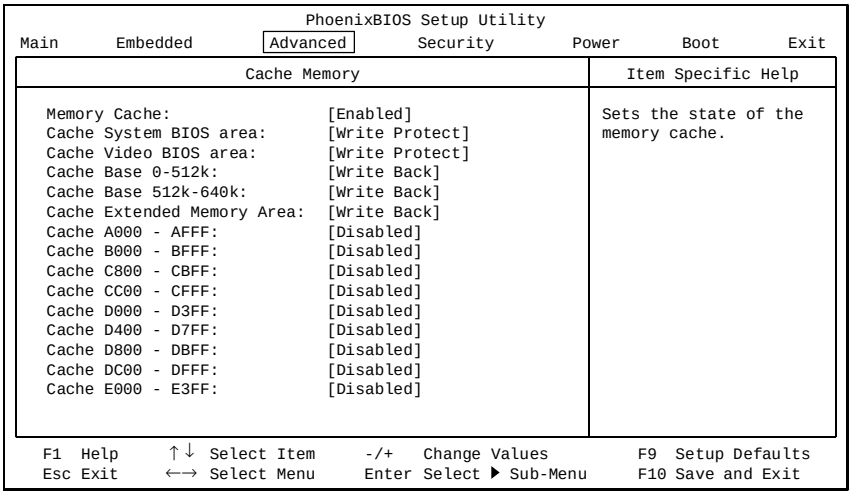

PhoenixBIOS Setup Utility
Main Embedded Advanced Security Power Boot Exit
Cache Memory
Item Specific Help
Memory Cache: [Enabled]
Cache System BIOS area: [Write Protect]
Cache Video BIOS area: [Write Protect]
Cache Base 0-512k: [Write Back]
Cache Base 512k-640k: [Write Back]
Cache Extended Memory Area: [Write Back]
Cache A000 - AFFF: [Disabled]
Cache B000 - BFFF: [Disabled]
Cache C800 - CBFF: [Disabled]
Cache CC00 - CFFF: [Disabled]
Cache D000 - D3FF: [Disabled]
Cache D400 - D7FF: [Disabled]
Cache D800 - DBFF: [Disabled]
Cache DC00 - DFFF: [Disabled]
Cache E000 - E3FF: [Disabled]
Sets the state of the memory cache.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Figure 4.7. Cache Memory Window (Factory Settings)

Keep the factory settings.

I/O Device Configuration Window

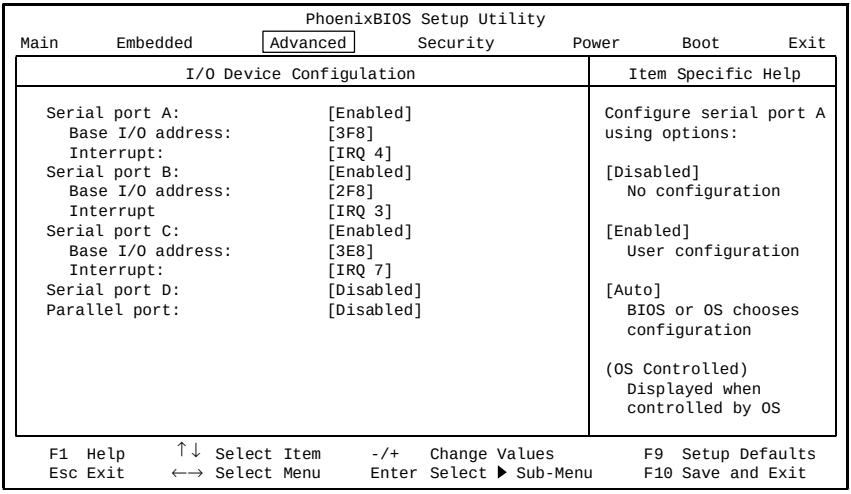

PhoenixBIOS Setup Utility
Main Embedded Advanced Security Power Boot Exit
I/O Device Configulation
Item Specific Help
Serial port A: [Enabled]
Base I/O address: [3F8]
Interrupt: [IRQ 4]
Serial port B: [Enabled]
Base I/O address: [2F8]
Interrupt [IRQ 3]
Serial port C: [Enabled]
Base I/O address: [3E8]
Interrupt: [IRQ 7]
Serial port D: [Disabled]
Parallel port: [Disabled]
Configure serial port A using options:
[Disabled]
No configuration
[Enabled]
User configuration
[Auto]
BIOS or OS chooses configuration
(OS Controlled)
Displayed when controlled by OS
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Figure 4.8. I/O Device Configuration Window (Factory Settings)

Serial port A : This setting is for SERIAL1 on the equipment connector plane.

Serial port B : This setting is for SERIAL2 on the equipment connector plane.

Serial port C : This setting is for serial communication of the touch-panel port.

Serial port D : This setting is for RS-422/485 of the RAS connector on the equipment connector plane.
When the port is set to "Enable," it defaults to the following:
Base I/O address [2E8]
Interrupt [IRQ5]

Parallel port : This setting is for PRINTER on the equipment connector plane.
When the port is set to "Enable," it defaults to the following:

Mode	[ECP]
Base I/O address	[378]
Interrupt	[IRQ7]
DMA channel	[DMA3]

Items to be set

Enable:
Manually set the base I/O address and IRQ. The IRQ you set here must be set to Available in the PCI Configuration window. (See the Note below).

Auto:
Automatically set by the BIOS. Enabled once the BIOS is started.

OS Controlled:
Automatically set by the OS. Remains disabled until the PnP OS is started.

Mode*:
Set to parallel port's operating mode.

DMA channel*:
This is the DMA channel setting used when ECP is selected during parallel-port mode setting.

* A menu exclusive to the parallel port.

Note!

If the following message appears on booting when serial port D or the parallel port are set to "Enable", this indicates a resource (IRQ) conflict or similar BIOS problem.

```
Error
0615: Com D configuration changed
```

In this case, enter the setup menu again and change the IRQ from "Reserved" to "Available" or modify the settings if an interrupt conflict occurs.

```
* Serial port D:    [Enable]  ← An asterisk (*) is displayed
  Base I/O address: [2E8]
  Interrupt:        [IRQ5]    → Set to "Available" in the PCI
                                Configuration window.
```

PCI/PnP ISA Reserve Exclusion

```
* IRQ5:   [Reserved]          → Change to [Available].
```

Security Window

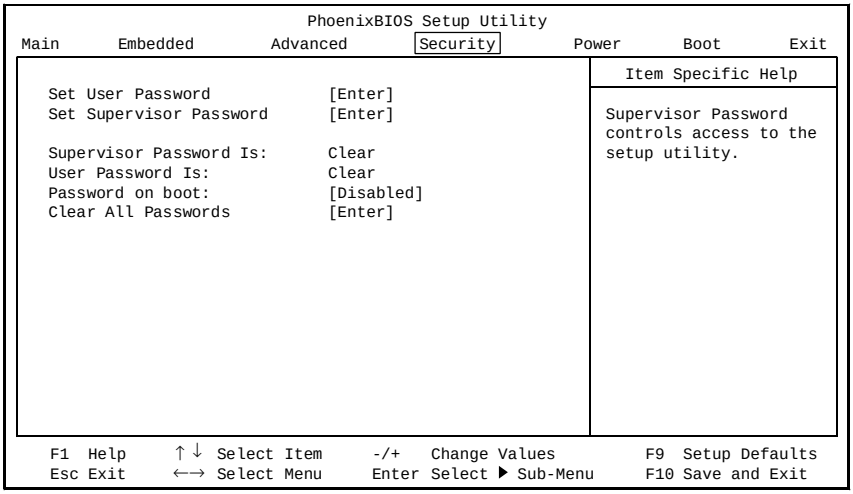

PhoenixBIOS Setup Utility
Main Embedded Advanced Security Power Boot Exit
Set User Password [Enter]
Set Supervisor Password [Enter]
Supervisor Password Is: Clear
User Password Is: Clear
Password on boot: [Disabled]
Clear All Passwords [Enter]
Item Specific Help
Supervisor Password controls access to the setup utility.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Figure 4.9. Security Window (Factory Settings)

Set Supervisor Password : Specify whether or not to require a password during setup. If a password is set, "Supervisor Password is" is enabled. Supervisor mode allows all settings to be set.

Set User Password : Specify whether or not to require a password during setup. If a password is set, "User Password is" is enabled. User mode allows only the date and time to be set.

Password on boot : Specify whether or not to require a password when booting.

Clear All Password : Both passwords can be erased by Supervisor.

Note!

Once a password is registered, even the password function itself cannot be cancelled without the password. Passwords should be handled with great care.

Power Window

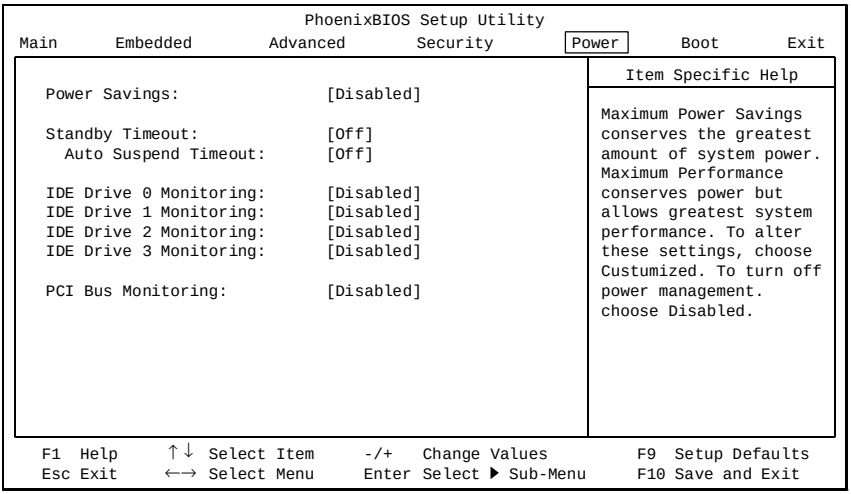

PhoenixBIOS Setup Utility
Main Embedded Advanced Security Power Boot Exit
Power Savings: [Disabled]
Standby Timeout: [Off]
Auto Suspend Timeout: [Off]
IDE Drive 0 Monitoring: [Disabled]
IDE Drive 1 Monitoring: [Disabled]
IDE Drive 2 Monitoring: [Disabled]
IDE Drive 3 Monitoring: [Disabled]
PCI Bus Monitoring: [Disabled]
Item Specific Help
Maximum Power Savings conserves the greatest amount of system power. Maximum Performance conserves power but allows greatest system performance. To alter these settings, choose Custumized. To turn off power management. choose Disabled.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Figure 4.10. Power Window (Factory Settings)

Power Savings : Specify whether or no to use power-saving mode. Choose from "Off", "Customize," "Maximum Performance," and "Maximum Power Savings."

Standby Timeout : Specify the length of time from the idle state through entry into standby mode. Standby mode turns off the power to peripherals including the screen.

Auto Suspend Timeout : Specify the time of transition from standby mode to suspend mode.

IDE DRIVE 0 Monitoring :
IDE DRIVE 1 Monitoring :
IDE DRIVE 2 Monitoring :
IDE DRIVE 3 Monitoring :
PCI Bus Monitoring :

Specify whether or not to use a device as an idle timer reset event.

Boot Window

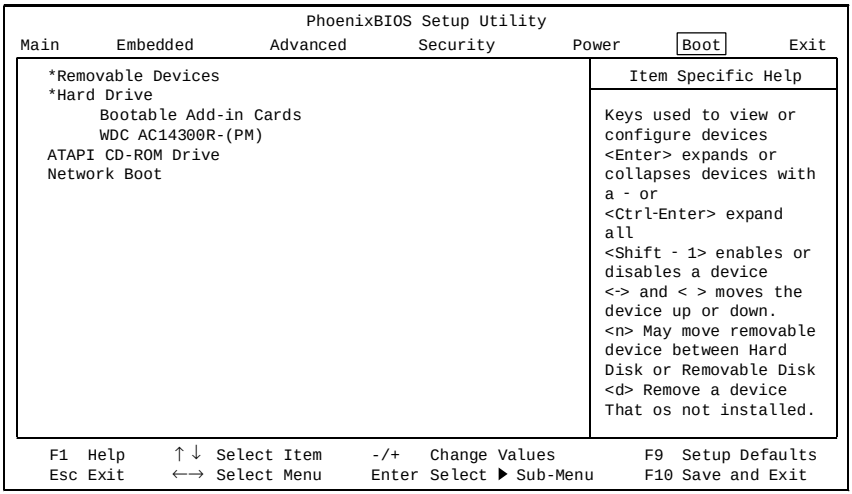

PhoenixBIOS Setup Utility
Main Embedded Advanced Security Power Boot Exit
*Removable Devices
*Hard Drive
Bootable Add-in Cards
WDC AC14300R-(PM)
ATAPI CD-ROM Drive
Network Boot
Item Specific Help
Keys used to view or configure devices
<Enter> expands or collapses devices with a - or
<Ctrl-Enter> expand all
<Shift - 1> enables or disables a device
<-> and < > moves the device up or down.
<n> May move removable device between Hard Disk or Removable Disk
<d> Remove a device That os not installed.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

Figure 4.11. Boot Window (Factory Settings)

Specify the order in which the system to be booted is checked. Using the <+> or <-> key, rearrange the selected items.

The following devices can be specified as boot devices:

Removable Devices	:	Removable devices such as the floppy disk and ATA card.
Hard Drive	:	Devices that are not removable, such as the hard disk drive and silicon disk drive.
ATAPI CD-ROM Drive	:	Optional CD-ROM drive (IDE connection)
Network Boot	:	This item is not available.

The items are displayed on the menu in priority order.

Exit Window

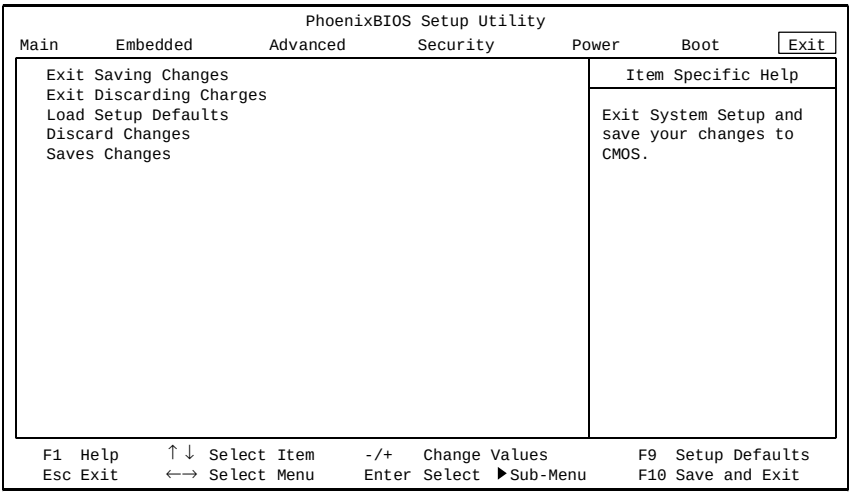


Figure 4.12. Exit Window

Exit Saving Changes : Saves values that have been modified on the setup screen in CMOS (EEPROM *1) and restarts the system.

Exit Discarding Changes : Restarts the system using the previous values without saving modified values in CMOS (EEPROM *1).

Load Setup Defaults : Sets default values that are in the possession of BIOS.

Discard Changes : Loads values that are currently in the possession of CMOS(EEPROM *1).

Save Changes : Saves values that have been modified on the setup screen in CMOS (EEPROM *1).

*1 S1's bit 2 allows you to specify the location where setup details will be saved and loaded.
Normally, set to ON (use CMOS).

ON: Uses the CMOS as the location to save and load setup details. (factory settings)

OFF: Uses the EEPROM as the location to save and load setup details.

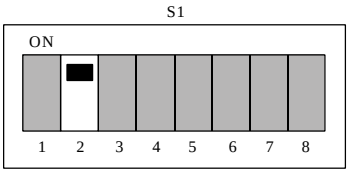
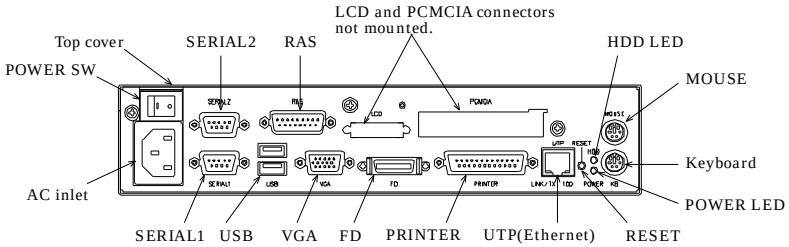


Figure 4.13. S1 Factory Setting

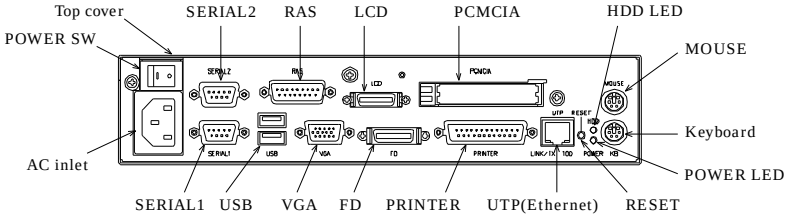
5. Each Component Function

Component Identification

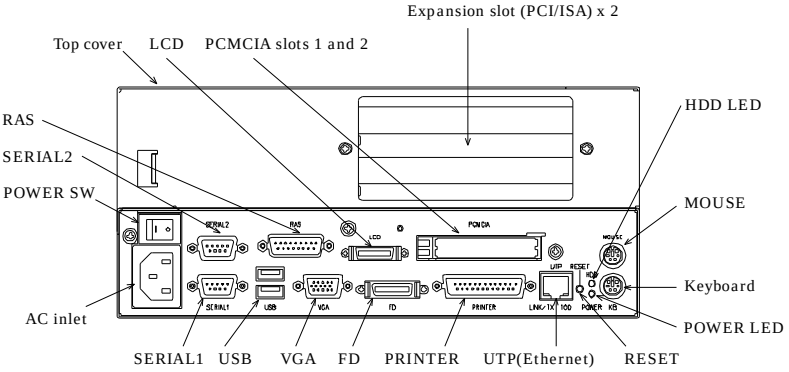
IPC-BX/M600(PCW)



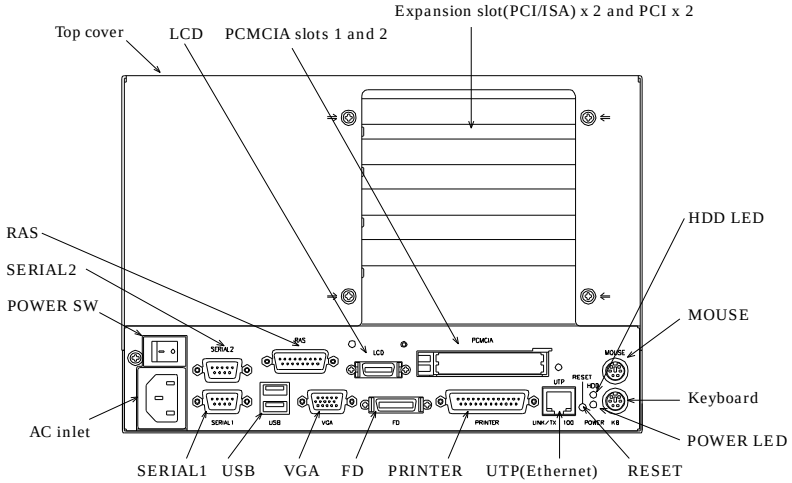
IPC-BX/M600(PCW)C



IPC-BX/M600(PCW)CP



IPC-BX/M600(PCW)C4P



Side view
IPC-BX/M600(PCW),
IPC-BX/M600(PCW)C

IPC-BX/M600(PCW)CP
IPC-BX/M600(PCW)C4P

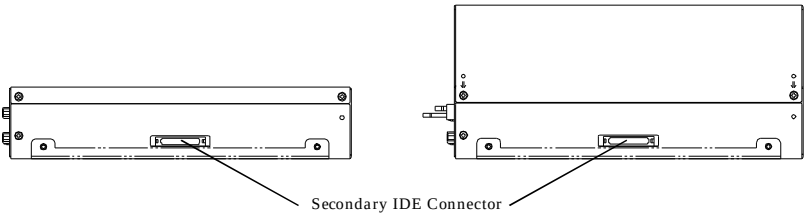


Figure 5.1. Component Identification

Table 5.1. Component Functions

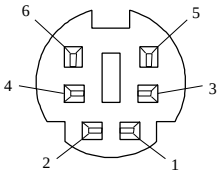
Component	Function
KB	Keyboard connector (MINI-DIN, 6pin)
MOUSE	PS/2 mouse connector (MINI-DIN, 6pin)
FD	Floppy disk drive connector (26pin, half-pitch connector)
SERIAL1	Serial port 1 connector (9pin, male D-SUB)
SERIAL2	Serial port 2 connector (9pin, male D-SUB)
VGA	CRT connector (15pin, female HD-SUB)
PCMCIA	PCMCIA card slot <C, CP and C4P models>
PRINTER	Parallel port connector (25pin, female D-SUB)
RAS	RAS function and RS-485 connector (15pin, female D-SUB)
RESET	Hard reset push button
USB	USB port connector
UTP	Ethernet connector
LCD	LCD connector (20pin, half-pitch connector) <C, CP and C4P models>
Expansion slots	PCI/ISA expansion board slot x 2 <CP model> PCI/ISA expansion board slot x 2, PCI expansion board slot x 1 <C4P model>
POWER LED	Power ON indicator
HDD LED	Internal hard disk access lamp
POWER SW	Power switch
AC INLET	AC power supply input connector
SECONDARY IDE	Secondary IDE connector (dedicated 40pin half-pitch connector)

Keyboard Interface

The BOX-PC is equipped with a keyboard connector named KB (MINI-DIN 6P).

Table 5.2. Keyboard Connector

Connector type	Equivalent to the MD-DS12300-14S-14 (JST)



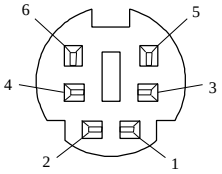
Pin No.	Signal	Pin No.	Signal
1	+KBD DATA	5	+KBD CLK
2	N.C.	6	N.C.
3	GND	SHIELD	GND
4	+5.0V DC	---	

Mouse Interface

The BOX-PC is equipped with a mouse connector named MOUSE (MINI-DIN 6P).

Table 5.3. Mouse Connector

Connector type	Equivalent to the MD-DS12300-14S-14 (JST)



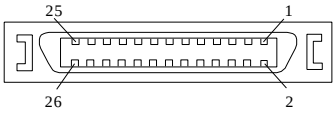
Pin No.	Signal	Pin No.	Signal
1	+MOUSE DATA	5	+MOUSE CLK
2	N.C.	6	N.C.
3	GND	SHIELD	GND
4	+5.0V DC	---	

Floppy Disk Interface

The BOX-PC is equipped with a FD controller to allow one FD drive to be connected to the FD connector named FD on the front end.
Use the FD drive that is available as a dedicated option.

Table 5.4. FD Connector

Connector in use	26-socket, half-pitch connector, Equivalent to the DX10G1M-26SE



Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	HDSEL	Output	2	WRTPRT	Input
3	RDATA	Input	4	TRK0	Input
5	GND	-----	6	GND	-----
7	GND	-----	8	WGATE	Output
9	GND	-----	10	GND	-----
11	WDATA	Output	12	GND	-----
13	DENSEL	Output	14	STEP	Output
15	DENSEL	Output	16	DIR	Output
17	N.C.	-----	18	MTR_ON	Output
19	DRV_SEL	Output	20	N.C.	-----
21	+5V	-----	22	DSKCHG	Input
23	+5V	-----	24	N.C.	-----
25	INDEX	Input	26	+5V	-----

Compatible Connector on the Cable Side

Plug connector	: AMP, P/N 1756774-4 (AWG#28 for pressure welding)
Shield case kit	: AMP, P/N 1756774-4

or

Plug connector	: 3M, P/N 10126-6000EL (AWG#28 for pressure welding)
Shell	: 3M, P/N 10326-3210-000

or

Plug connector	: 3M, P/N 10126-3000VE (AWG#24-#30 provided with solder)
Shell system	: 3M, P/N 10326-52F0-008 (Non-shield shell kit)

Cable Length

Use within a maximum cable length of 60cm.

Serial Port Interface

RS-232C Ports (Serial ports A and B)

The BOX-PC is equipped with two RS-232C-compliant serial port connectors (SERIAL1: Serial port A and SERIAL2: Serial port B). Each port can be set independently to COM1-COM4 or "not in use" by BIOS setup (the identical COM number cannot be specified).

Table 5.5. SERIAL 1 and 2 I/O Addresses and Interrupts

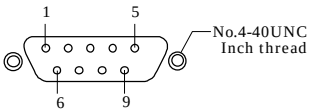
COM	I/O Address	Interrupt
1	3F8h-3FFh	IRQ 3 IRQ 4
2	2F8h-2FFh	IRQ 5 IRQ 7
3	3E8h-3EFh	IRQ 9 IRQ 10
4	2E8h-2EFh	IRQ 11 IRQ 15

The BIOS defaults to the following factory settings:

```
Serial port A : COM1(3F8h-3FFh),IRQ4
Serial port B : COM2(2F8h-2FFh),IRQ3
```

Table 5.6. Serial Port Connector

Connector used on the unit	9-socket D-SUB (MALE)



Pin No.	Signal	Meaning	Direction
1	CD	Carrier detect	Input
2	RD	Received data	Input
3	TD	Transmitted data	Output
4	DTR	Data terminal ready	Output
5	GND	Signal ground	-----
6	DSR	Data set ready	Input
7	RTS	Request to send	Output
8	CTS	Clear to send	Input
9	RI	Ring indicator	Input

RS-422/485 Port (Serial port D)

The BOX-PC is equipped with a serial port for one channel inside the RAS connector. BIOS setup (see Chapter 4) allows I/O addresses, interrupts and "not in use" to be set. (The port cannot be set to the same I/O address or interrupt as of another device.)

Table 5.7. Serial Port D I/O Addresses and Interrupts

COM	I/O Address	Interrupt
1	3F8h-3FFh	IRQ 3 IRQ 4
2	2F8h-2FFh	IRQ 5 IRQ 7
3	3E8h-3EFh	IRQ 9 IRQ 10
4	2E8h-2EFh	IRQ 11 IRQ 15

The BIOS defaults to the following factory settings:

```
Serial port D : Disable
```

RS-422/RS-485 Specifications

- Transmission method : RS-422/RS-485-compliant, asynchronous, serial transmission, half duplex/full duplex
- Baud rate : 19,200-50bps (programmable)
- Signal extension distance: 1.2km Max.

Output Connector When RS-422/RS-485 Is in Use

Table 5.8. Output Connector when the RS-422/RS-485 Is in Use (RAS Connector)

Pin No.	Signal	Meaning
2	TX +	Transmitted data +
10	TX -	Transmitted data -
3	RX +	Received data +
11	RX -	Received data -

For more information on the RAS connector see Table 5.16., "RAS connector."

Terminal Resistor when RS-485 is in Use

Set with JP4 inside the top cover. The factory setting is " terminal resistor not available."

Figure 5.2. Terminal Resistor Settings

Control of Transmitted Data in Half-Duplex Mode

In half-duplex mode, the transmission buffer needs to be controlled in order to prevent collision of transmitted data. The BOX-PC uses RTS and controls the buffer with modem control register's bit 1. Transmission and reception gate control by the register setting of port address 4006h and 4007h is allowed only for the RS-422/485 (Serial port D). For more information see section, "General-purpose I/O and Remote Reset" in Chapter 5.

Modem control register

(Set I/O address +4H) bit 1: 0 … RTS is High.
(Disable transmission)
1 … RTS is Low.
(Enable transmission)

I/O Addresses and Instructions

The I/O addresses and instructions of COM1 are shown next.

Table 5.9. I/O Addresses

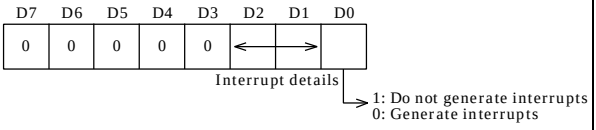
I/O address	DLAB	Read/Write	Register	
03F8H	0	W	Transmitter holding register	THR
		R	Receive buffer register	RBR
	1	W	Divisor latch register	DLL
03F9H	1	W	Divisor latch register	DLM
	0	W	Interrupt enable register	IER
03FAH	X	R	Interrupt ID register	IIR
03FBH	X	W	Line control register	LCR
03FCH	X	W	Modem control register	MCR
03FDH	X	R	Line status register	LSR
03FEH	X	R	Modem status register	MSR
03FFH	X	R/W	Scratch register	SCR

DLAB (Divisor Latch Access Bit) : The value in bit 7 of the line control register

Table 5.10. Function of Each Register *< 1 / 4 >*

I/O address	Description
03F8H	THR: Transmitter Holding Register [DLAB=0] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Register dedicated to write transmitted data to
03F8H	RBR: Reciever Buffer Register [DLAB=O] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Register dedicated to read received data from
03F8H	DLL: Divisor Latch (LSB) [DLAB=1] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Baud rate setting register (LSB)
03F9H	DLH: Divisor Latch (MSB) [DLAB=1] D7 D6 D5 D4 D3 D2 D1 D0 bit7 MSB ← → bit0 LSB Baud rate setting register (MSB)
03F9H	IER: Interrupt Enable Register [DLAB=0] D7 D6 D5 D4 D3 D2 D1 D0 0 0 0 0 EMS ELSI ETHREI ERDAI ERDAI: Received data Interrupt enable ETHREI: Received data register empty Interrupt enable ELSI: Receiver line status Interrupt enable EMS: Modem status interrupt enable [Always used at 0.] 1: Enable interrupt 0: Disable interrupt

Table 5.10. Function of Each Register *< 2 / 4 >*

<table>
<tr><th>I/O address</th><th>Description</th></tr>
<tr><td>03FAH</td><td>
IIR : Interrupt Identification Register


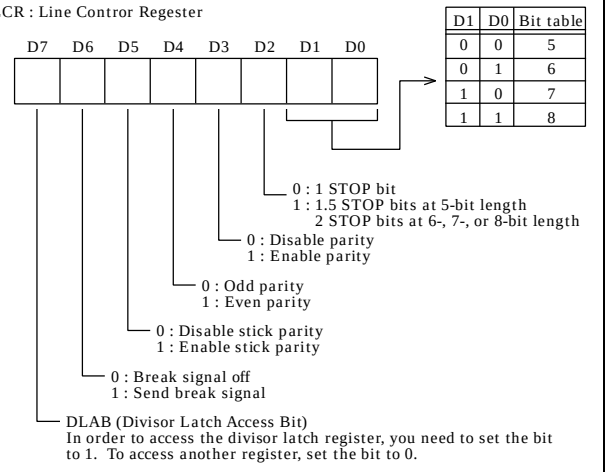
<table>
<tr><th>bit2</th><th>bit1</th><th>bit0</th><th>Priority</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>1</td><td>——</td><td>Interrupts are not generated.</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1 (high)</td><td>Generated by overrun, parity, framing error or break interrupt.
Cleared when the line status register is read.</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>2</td><td>Generated when the receive buffer register is ready.
Cleared when the receiving buffer is read.</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>3</td><td>Generated when the transmitter holding register is empty. Cleared when the IIR is read or when transmitted data is written to THR.</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>4 (low)</td><td>Modem status interrupt is generated.
(CTS, DSR, RI, CD)
Cleared when the modem status register is read.</td></tr>
</table>
</td></tr>
<tr><td>03FBH</td><td>
LCR : Line Contror Regester

D7 D6 D5 D4 D3 D2 D1 D0
D1 D0 Bit table
0 0 5
0 1 6
1 0 7
1 1 8
0 : 1 STOP bit
1 : 1.5 STOP bits at 5-bit length
2 STOP bits at 6-, 7-, or 8-bit length
0 : Disable parity
1 : Enable parity
0 : Odd parity
1 : Even parity
0 : Disable stick parity
1 : Enable stick parity
0 : Break signal off
1 : Send break signal
DLAB (Divisor Latch Access Bit)
In order to access the divisor latch register, you need to set the bit to 1. To access another register, set the bit to 0.
</td></tr>
</table>

Table 5.10. Function of Each Register < *3 / 4* >

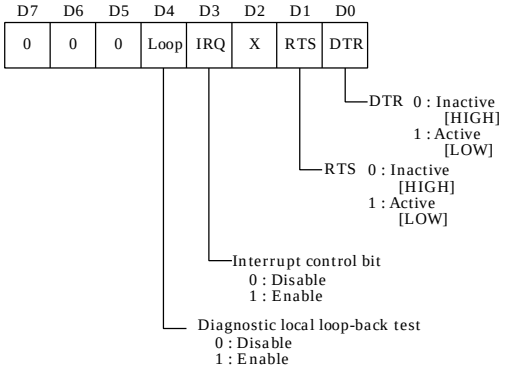
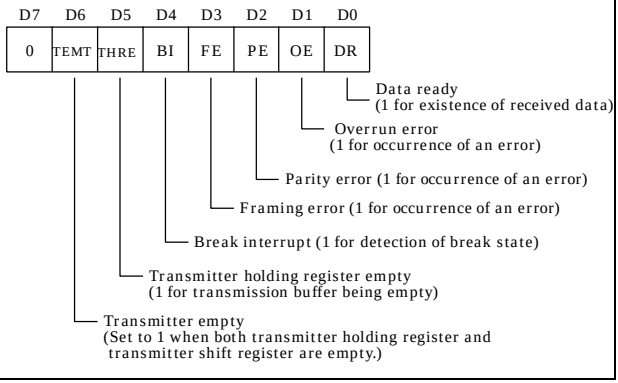
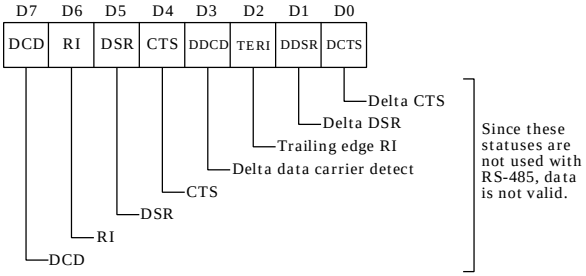
I/O address	Description
03FCH	MCR: Modem Control Register 
03FDH	LSR: Line Status Regester 

Table 5.10. Function of Each Register ***< 4 / 4 >***

I/O address	Description
03FEH	MSR : Modem Status Register 
03FFH	SCR : Scratchpad Register This is an 8-bit, readable/writable register which is available to the user to allow data to be saved temporarily.

Setting Baud Rates

A baud rate is set by software by dividing the clock input (1.8432MHz). To set a baud rate, write a value found in the following list to the divisor latch registers (LSB and MSB).

Table 5.11. Baud Rate Settings

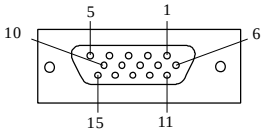
Baud rate to be set	Value to be set in the divisor register	Setting error (%)
50	2304	---
75	1536	---
110	1047	0.026
134.5	857	0.058
150	768	---
300	384	---
600	192	---
1200	96	---
1800	64	---
2000	58	0.69
2400	48	---
3600	32	---
4800	24	---
7200	16	---
9600	12	---
19200	6	---

Example: To set 9,600 bps, write "00" to the (MSB) divisor latch register and "12 (decimal)" to the (LSB) divisor latch register.

CRT Interface

The BOX-PC is equipped with a CRT connection connector named VGA (HD-SUB 15P).

Table 5.12. CRT Connector

Connector type	15pin HD-SUB (FEMALE)		
			
Pin No.	Signal	Pin No.	Signal
1	RED	9	N.C.
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	N.C.
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	N.C.
8	GND		

Display Driver

The display driver compatible with each OS is downloadable from the CONTEC home page or can be purchased separately as an option.

Set of optional driver software and utility software
: IPC-SLIB-01 (provided on a CD-ROM)
(Windows 98 Second Edition, Windows NT 4.0, Windows 2000 Professional)

Table 5.13. Drivers for Each OS

OS	Windows 98 Second Edition	Windows NT 4.0	Windows 2000 Professional
Display driver	Use IPC-SLIB-01	Use IPC-SLIB-01	Use standard Windows 2000 driver
LAN driver	Use standard Windows 98 Second Edition driver	Use IPC-SLIB-01 However, the driver cannot be installed from the CD-ROM. Copy the driver to an FD and install from the FD.	Use standard Windows 2000 driver

Refer to the readme files in IPC-SLIB-01 for details of the driver installation procedure.

PCMCIA Slots (C, CP and C4P Models)

The BOX-PC is equipped with PCMCIA-compliant card slots [TYPE II x 2 (TYPE III x 1) size].

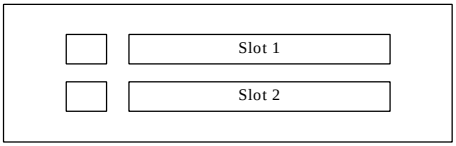


Figure 5.3. Slot Numbers and Locations

Note!

A type III card should be inserted into slot 2.

Attaching the Metal Brace to Keep the Card in Place

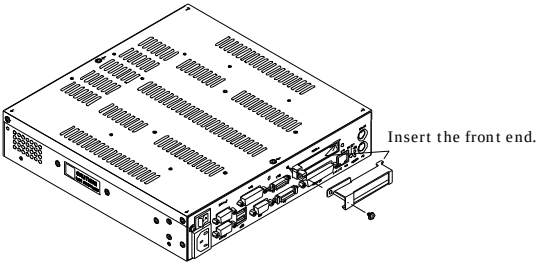


Figure 5.4. Attaching the Metal Brace to Keep the Card in Place

Power Supply to the Card

The voltage that can be used and the current capacity of each slot are as shown below:

Table 5.14. Power Supply to the Card

Voltage	Current capacity (Max.)
+5V	1A/Slot
+3.3V	1A/Slot
+12V	Not supplied.

Printer Port Interface

The BOX-PC is equipped with one printer port interface. BIOS setup (see Chapter 4) allows LPT1-3 and "not in use" to be set. The connector is named PRINTER.

Table 5.15. Printer Ports and I/O Addresses

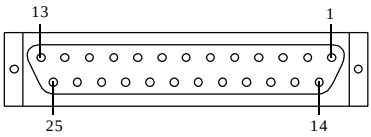
LPT	I/O address	Interrupt
1	3BCh-3BFh	IRQ 5 IRQ 7
2	378h-37Fh	
3	278h-27Fh	

The BIOS defaults to the following factory settings:

```
Parallel port : Disable
```

Table 5.16. Printer Port Connector

Connector used on the unit	25pin D-SUB (FEMALE)



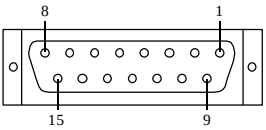
Pin No.	Signal	Meaning	Direction	Pin No.	Signal	Meaning	Direction
1	-STRB	Enable data	Output	14	-AFEED	Automatic feed	Output
2	D 0	Data bit 0	Output	15	-ERROR	Not available	Input
3	D 1	Data bit 1	Output	16	-INIT	Initialize	Output
4	D 2	Data bit 2	Output	17	-SELECT*IN	Input allowed	Output
5	D 3	Data bit 3	Output	18	GND	Ground	-----
6	D 4	Data bit 4	Output	19	GND	Ground	-----
7	D 5	Data bit 5	Output	20	GND	Ground	-----
8	D 6	Data bit 6	Output	21	GND	Ground	-----
9	D 7	Data bit 7	Output	22	GND	Ground	-----
10	-ACK	Ready to accept data	Input	23	GND	Ground	-----
11	BUSY	Busy	Input	24	GND	Ground	-----
12	PE	Out of paper	Input	25	GND	Ground	-----
13	SELECT	Select state	Input	-----			

Fastening screw: No. 4-40 UNC inch thread

RAS Functions

As RAS functions, the BOX-PC is equipped with watchdog timer, remote reset, and general-purpose I/O functions. Each I/O can be achieved with the RAS connector.

Table 5.17. RAS Connector

Connector type	15pin D-SUB(FEMALE) (DALC-J15SAF-20L9) JAE	
		
Pin No.	Signal	Function
1	SPK	External speaker signal
9	GND	External speaker ground
2	TX +	RS-485 transmitting line
10	TX -	
3	RX +	RS-485 receiving line
11	RX -	
4	NCOM	Minus common dedicated to PO2
12	PO2/WDT	General-purpose output or watchdog timer alarm output
5	PO0	General-purpose output
13	PO1	
6	NCOM	General-purpose output minus common
7	PI1	General-purpose input
14	PI2/IRQ	General-purpose input or interrupt input
8	PCOM	General-purpose input plus common
15	PI0	General-purpose input

*Fastening screw: No. 4-40UNC inch thread

RAS port address: 4000h~4001h

Note!

Pin 4 NCOM (minus common dedicated to PO2) and pin 6 NCOM (minus common shared by PO0 and PO1) are electrically separated from each other.

Watchdog Timer

The watchdog timer is started by output of A5 to I/O port address 4002h. A second output of A5 to the same port within the specified expiration time once again triggers the watchdog timer. If a time-out occurs, a reset or an interrupt is generated according to the 4004h port setting or an alarm is output according to the 4004h port setting.

The expiration time can be set in a range of 244.14 µsec through 255sec using the counter clock setting in combination with the timer setting of port (4003h) for the WDT counter.

The watchdog timer stops by reading port 4002h. The alarm-out output is cancelled at the same time.

The alarm out is output from the RAS connector's PO2/WDT (pin 12) and cancelled when reset.

The alarm-out output can be set to BIOS startup by BIOS setup (see Chapter 4), watchdog timer startup, or watchdog timer time-up.

Specifications

- Time to be set:	244.14µsec-255sec (Port setting)
- Interrupt or reset:	Resets or generates an interrupt at time-up (Port setting).
- External alarm output:	Photocoupler insulated open-collector output (the output status is set by software). For more information, see the general-purpose I/O specifications.
- I/O addresses:	4000h through 4007h (RAS port) 0070h, 0071h (RTC)

How to Use the Watchdog Timer

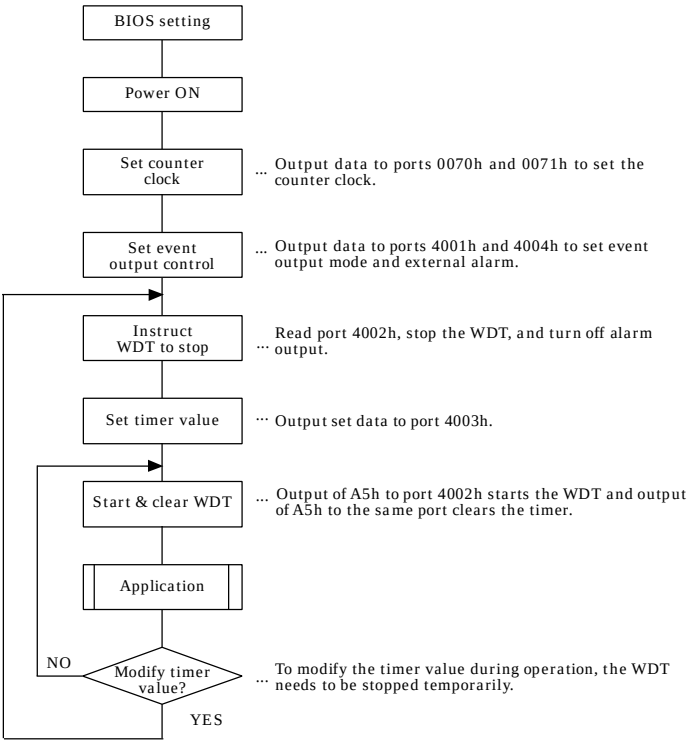

BIOS setting
Power ON
Set counter clock
... Output data to ports 0070h and 0071h to set the counter clock.
Set event output control
... Output data to ports 4001h and 4004h to set event output mode and external alarm.
Instruct WDT to stop
... Read port 4002h, stop the WDT, and turn off alarm output.
Set timer value
... Output set data to port 4003h.
Start & clear WDT
... Output of A5h to port 4002h starts the WDT and output of A5h to the same port clears the timer.
Application
NO
Modify timer value?
... To modify the timer value during operation, the WDT needs to be stopped temporarily.
YES
*WDT: Watch Dog Timer

Figure 5.5. How to Use the Watchdog Timer

Example usage: To assign IRQ5 to the event whose counter clock is 250ms and time-up value is 15sec:

Out 0070h 0Ah	:	Set the counter clock index register to register A.
In 0071h	:	Read register A to view rsv bit status.
Out 0071h 2Dh	:	Set counter clock frequency to 250 msec.
	:	(Do not change the rsv bit.)

Out 0070h 0Bh	:	Set the counter clock index register to register B.
In 0071h	:	Read register B to view rsv bit status.
Out 0071h 0Ah	:	Set counter clock output to Enable.
	:	(Do not change the rsv bit.)
Out 4004h 02h	:	Set the event at the time of WDT expiration to IRQ5.
In 4002h	:	Stop the WDT timer and cancel the alarm.
Out 4003h 3Ch	:	Set the WDT expiration time to 15sec.
Out 4002h A5h	:	Start and clear the WDT.
In 4002h	:	Stop the WDT and cancel the alarm.

I/O Addresses and Instructions

* 0070h: Counter clock setting 1 (index register)

Select the register to be set at 0071h.

D7	D6	D5	D4	D3	D2	D1	D0	
AD7	AD6	AD5	AD4	AD3	AD2	AD1	AD0	R/W

Figure 5.6. Index Register Port

By referring to Table 5.17, output data to 0070h according to the register you want to set at 0071h.

Table 5.18. Index Register Settings

Register to be set at 0071h	AD7	AD6	AD5	AD4	AD3	AD2	AD1	AD0	Data (HEX)
Register A	0	0	0	0	1	0	1	0	0A
Register B	0	0	0	0	1	0	1	1	0B

* Do not set values other than shown above.

* 0071h: Counter clock setting 2 (clock control register)

Set clock frequency in register A and control output with register B.

D7	D6	D5	D4	D3	D2	D1	D0	
rsv	rsv	rsv	rsv	RS3	RS2	RS1	RS0	R/W (default: 00100110b)

Figure 5.7. Register A: Counter Clock Frequency Setting

Table 5.19. Counter Clock Frequency Settings

RS3	RS2	RS1	RS0	Counter clock	Unit
0	0	0	0	---	
0	0	0	1	7.8125	msec
0	0	1	0	15.625	msec
0	0	1	1	244.14	µsec
0	1	0	0	488.282	µsec
0	1	0	1	976.562	µsec
0	1	1	0	1.958125	msec
0	1	1	1	3.9063	msec
1	0	0	0	7.8125	msec
1	0	0	1	15.625	msec
1	0	1	0	31.25	msec
1	0	1	1	62.5	msec
1	1	0	0	125	msec
1	1	0	1	250	msec
1	1	1	0	500	msec
1	1	1	1	1	sec

D7	D6	D5	D4	D3	D2	D1	D0	
rsv	rsv	rsv	rsv	CLKE	rsv	rsv	rsv	R/W (default: 00000010b)

Figure 5.8. Register B: Counter Clock Output Control

CLKE: Enable setting for the clock to be input to the counter
1 : Enabled
0 : Disabled

* Do not change the rsv bits since they are used by the system. After reading the same port, manipulate bits to write data one more time.

* 4001h (bit4-6): Alarm out output control

D7	D6	D5	D4	D3	D2	D1	D0	
---	WD_S1	WD_S0	PO2_M	RESET	PIM2	PIM1	PIM0	R/W (Default: X0XX0000b)

Figure 5.9. Alarm Out Output Control Port (4001h)

PO2_M : PO2/WDT pin output setting
0 : Set the RAS connector's PO2/WDT(12) signal to PO2 (general-purpose output).
1 : Set the RAS connector's PO2/WDT(12) signal to alarm out.

Table 5.20. WD_S1 and WD_S0: Alarm-out Output Status Settings

WD_S1	WD_S0	External alarm output status			
		When power is turned off	When BIOS starts *1	When WDT starts	When time expires on WDT
0	0	OFF	OFF	OFF	ON
1	0	OFF	OFF	ON	OFF
1	1	OFF	ON	ON	OFF
0	1	OFF	ON	OFF	ON

*1: For information on the external alarm output setting at BIOS startup, see Chapter 4, BIOS Setup.

* 4002h: WDT control

D7	D6	D5	D4	D3	D2	D1	D0	
—	—	—	—	—	—	—	—	R/W

Figure 5.10. WDT Control Port (4002h)

R : Cancels WDT stop/alarm.
Read data is undefined.

W : Start and clear the WDT
Write A5h to start and clear the WDT.

* 4003h: WDT counter

D7	D6	D5	D4	D3	D2	D1	D0	
T7	T6	T5	T4	T3	T2	T1	T0	W

Figure 5.11. WDT Counter Port (4003h)

W : Writes watchdog timer count data.
Write watchdog timer counter expiration time data. The watchdog timer counter clock can be set to 13 levels within a range of 244.14 µsec through 1sec. The following is an example time-up setting when the clock is set to 250msec:
0.5sec → 02h
1sec → 04h
4sec → 10h
8sec → 20h
15sec → 3Ch
30sec → 78h

* 4004h: Event output control

D7	D6	D5	D4	D3	D2	D1	D0	
---	---	---	---	RESET	WM2	WM1	WM0	R/W (Default: XXXX0000b)

Figure 5.12. Event Output Control Port (4004h)

Table 5.21. WM2-WM0: Interrupt Output Modes

WM2	WM1	WM0	Interrupt output at occurrence of WDT errors
0	0	0	Inhibit interrupt output when time expires on the WDT.
0	0	1	Output to NMI when time expires on the WDT.
0	1	0	Output to IRQ5 when time expires on the WDT.
0	1	1	Output to IRQ7 when time expires on the WDT.
1	0	0	Output to IRQ9 when time expires on the WDT.
1	0	1	Output to IRQ10 when time expires on the WDT.
1	1	0	Output to IRQ11 when time expires on the WDT.

Table 5.22. RESET: Reset Output Modes

RESET	RESET output at occurrence of WDT errors
0	Inhibits RESET output when time expires on the WDT.
1	Allows RESET output when time expires on the WDT.

Note! When time expires on WDT, the alarm-out is output irrelevant to the settings of the port for controlling event output.

* 4005h: RAS status port

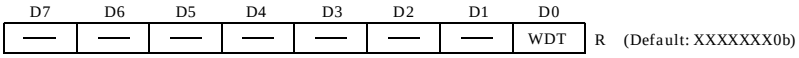


Figure 5.13. RAS Status Port (4005h)

R : RAS status port

WDT: WDT status

This is the WDT status bit. This bit is cleared when the WDT stops (read port 4002h).

0 : The WDT is either stopped or counting.

1 : The time set on the WDT expired.

General-purpose I/O and Remote Reset

The BOX-PC is equipped with three general-purpose insulated signals each for input and output. The input signals can also be used for interrupt input or remote reset input.

Specifications

[Input]

- Input specifications : Current-driven input by photocoupler insulation.
- Input resistance : 4.7kΩ
- Input signal count : 3 [One of them can be used for remote reset and interrupt input. (bit2<fixed>)]
- Input protection circuit : Equipped with a reverse-connection protection diode
- Input response time : Less than 100µsec
- External circuit power supply: 12-24VDC (±10%)

[Output]

- Output specifications : Open-collector output by photocoupler insulation
- Output rating : Max. 30VDC, 100mA
- Output signal count : 3 [One of them can be used for WDT alarm output. (bit2<fixed>)]
- Output response time : Less than 300µsec

[Common]

- I/O addresses 4000h and 4001h

How to Use General-purpose I/O and Remote Reset

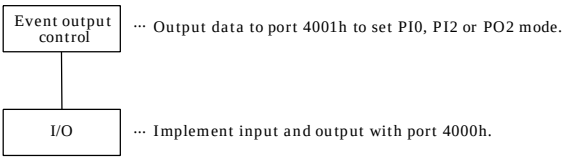


Figure 5.14. How to Use General-purpose I/O and Remote Reset

I/O Addresses and Instructions

* 4000h: General-purpose I/O

D7	D6	D5	D4	D3	D2	D1	D0	
—	—	—	—	—	PIO2	PIO1	PIO0	R/W

Figure 5.15. General-purpose Input Port (4000h)

R : Read data from PI0, PI1 and PI2.

W : Set data to be output to PO0, PO1 and PO2.

* 4001h (bit0-3): PI2/IRQ(14) event input control

D7	D6	D5	D4	D3	D2	D1	D0
—	WD_S1	WD_S0	PO2_M	RESET	PIM2	PIM1	PIM0

Figure 5.16. Event Input Control Port (4001h)

Table 5.23. PIM2-PIM0

PIM2	PIM1	PIM0	PI2/IRQ (14) interrupt input
0	0	0	Inhibit the RAS connector's PI2/IRQ (14) signal interrupt to be set.
0	0	1	Input the RAS connector's PI2/IRQ (14) signal to NMI.
0	1	0	Input the RAS connector's PI2/IRQ (14) signal to IRQ5.
0	1	1	Input the RAS connector's PI2/IRQ (14) signal to IRQ7.
1	0	0	Input the RAS connector's PI2/IRQ (14) signal to IRQ9.
1	0	1	Input the RAS connector's PI2/IRQ (14) signal to IRQ10.
1	1	0	Input the RAS connector's PI2/IRQ (14) signal to IRQ11.

Table 5.24. RESET: Reset Input Modes

RESET	PI2/IRQ (14)'s RESET input
0	Inhibit the remote reset input function of the RAS connector's PI2/IRQ (14) signal.
1	Use as the remote reset input function of the RAS connector's PI2/IRQ (14) signal.

Note!

A bit indicated with "rsv" is used by the system.
Do not modify the bit.

* 4006h: Index address setting

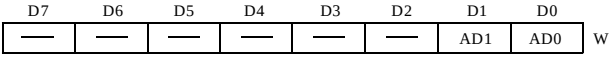


Figure 5.17. Index Address Setting Port (4006h)

W : Index address setting
When specifying the RS-485 setting with port 4007h, output 00h to this port before you specify the setting. (* Index addresses other than 00h are used by the system. Do not set addresses except for 00h.)

* 4007h: Control of RS-485 transmission and reception

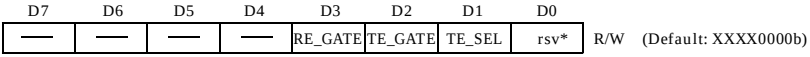


Figure 5.18. RS-485 Transmission and Reception Control Port (4007h)

TE_SEL : Select the RS-485 transmission enable signal.

0 : Sets the RTS signal to the RS-485 transmission enable signal. (factory setting)

1 : Sets the TE_GATE value to the RS-485 transmission enable signal.

TE_GATE : RS-485 transmission enable signal. Valid only when the TE_SEL value is "1."

0 : RS-485 transmission Enable (factory setting)

1 : RS-485 transmission Disable

RE_GATE : RS-485 reception enable signal.

0 : RS-485 reception Enable (factory setting)

1 : RS-485 reception Disable

Note!

A bit indicated with "rsv" is used by the system.
Do not modify the bit.

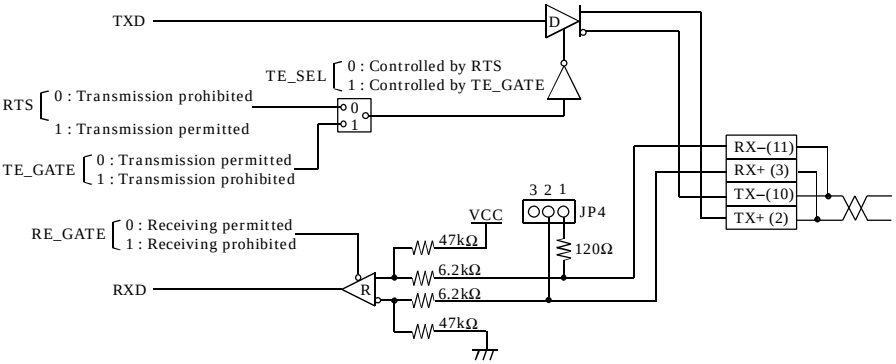


Figure 5.19. Half-Duplex Connection Method

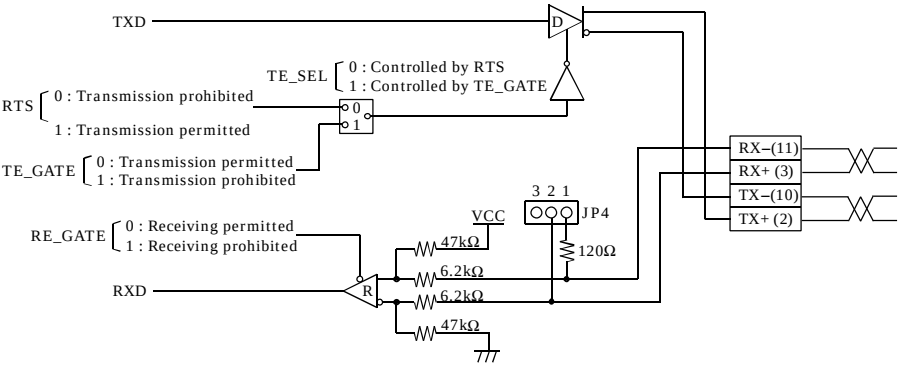


Figure 5.20. Full-Duplex Connection Method

External I/O Circuit

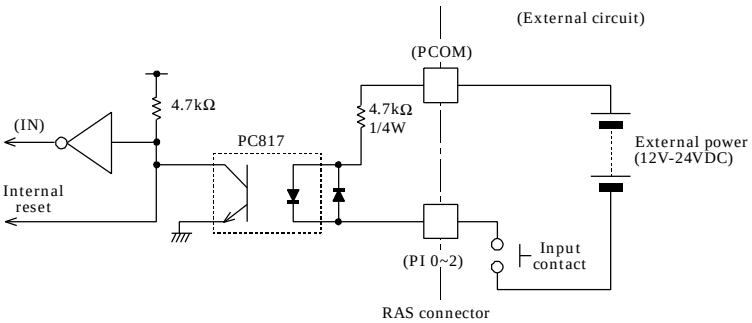


Figure 5.21. Input Circuit

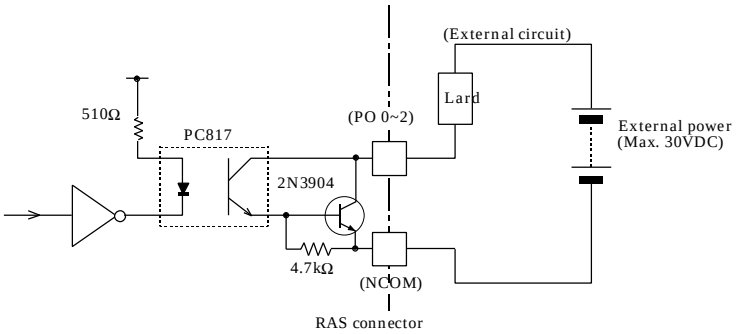


Figure 5.22. Output Circuit

S1

S1's bit 2 selects whether to use CMOS or EEPROM for BIOS setup details. For more information, see Chapter 4, "BIOS Setup."

S1's bits 5-8 are the LCD setting switch. For more information, see section, "Liquid Crystal Display (LCD) Interface" in Chapter 5.

Do not modify the settings of S1 bits 1, 3 and 4 since they are used by the system.

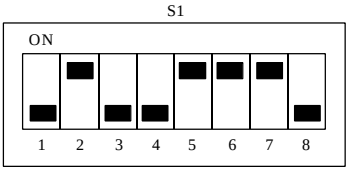


Figure 5.23. Factory Settings

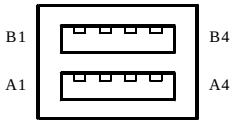
Reset Switch

The BOX-PC is equipped with a hardware reset switch. To prevent it from being pressed by mistake, the switch is designed to be difficult to press. Use a pointed object to push the switch with.

USB Ports

The BOX-PC is equipped with two USB interface channels.

Table 5.25. USB Connector



Pin No.	Signal	Pin No.	Signal
A1	USB0 Vcc	B1	USB1 Vcc
A2	USB0 -Data	B2	USB1 -Data
A3	USB0 +Data	B3	USB1 +Data
A4	USB0 GND	B4	USB1 GND

Ethernet

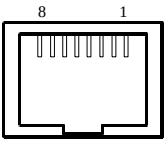
The BOX-PC is equipped with Fast-Ethernet.

- Network type : 100BASE-TX/10BASE-T
- Transmission speed* : 100M/10M bps
- Max. network path length: 100m/segment
- Controller : 82559(INTEL)

* Operation at 100Mbps requires a category 5 cable.

Table 5.26. Ethernet Connector

Connector type	RJ-45



Pin No.	Signal	Meamimg
1	TD+	Transmitted data (+)
2	TD-	Transmitted data (-)
3	RD+	Received data (+)
4	N.C.	Not connected
5	N.C.	Not connected
6	RD-	Received data (+)
7	N.C.	Not connected
8	N.C.	Not connected

LEDs for display of network statuses:

LINK : Normal connection indicator
FDX : Full-duplex mode indicator
100M : 100M-operation indicator

Reference

For more information on the LAN drivers, see Table 5.13. "Drivers for Each OS".

Installing the LAN driver for Windows NT 4.0

Prepare a formatted FD and copy all the files in the [\x600PCW\Drivers\LAN\NT40] directory in IPC-SLIB-01 to the FD. Run Setup from the FD.
(You cannot run Setup directly from the CD-ROM.)

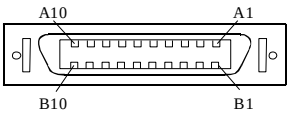
The standard LAN driver provided with Windows NT 4.0 cannot be used.

Liquid Crystal Display (LCD) Interface

The BOX-PC is equipped with an LCD connector to allow an LCD manufactured by CONTEC to be connected. The table below lists the LCDs that can be connected. Set S1-5 through S1-8 according to the display in use. Note that in order to connect an LCD, you need a connecting cable.

Table 5.27. Liquid Crystal Display (LCD) Interface

Connector in use	20-socket, half-pitch connector, Equivalent to the10220-55G3JL(3M)



Pin No.	Signal	Direction	Pin No.	Signal	Direction
A1	TX1+	Output	B1	TX2+	Output
A2	TX1–	Output	B2	TX2–	Output
A3	TX1 Shield	-------	B3	TX2 Shield	-------
A4	TXC Shield	-------	B4	TX0 Shield	-------
A5	TXC+	Output	B5	TX0+	Output
A6	TXC–	Output	B6	TX0–	Output
A7	RESERVED*	-------	B7	N.C.	-------
A8	RESERVED*	-------	B8	N.C.	-------
A9	TXD	Output	B9	RESERVED*	-------
A10	RXD	Input	B10	RESERVED*	-------

* Connect nothing for the pin of RESERVED.

Table 5.28. LCD Connection List

Display	Model	Display	SW1 settings
* 12.1inch TFT with a panel-mounting touch panel	IPC-DT/L40S(PC)T	SVGA (800 x 600)	S1-5 : ON S1-6 : ON S1-7 : ON S1-8 : OFF
15inch TFT with a panel-mounting touch panel	IPC-DT/H40X(PC)T	XGA (1024 x 768)	S1-5 : OFF S1-6 : ON S1-7 : ON S1-8 : ON

* Factory settings

- A CRT (connected to the VGA connector) and an LCD can be used simultaneously. However, the display area on the CRT is the same as on the LCD.
- To use only the CRT, select CRT during BIOS setup (see Chapter 4).

Serial Interface for Touch Panel (Inside the LCD connector)

The BOX-PC is equipped with a serial port (Serial port C) to communicate with a touch panel when an LCD equipped with a touch panel is used. The I/O address, interrupt, or "not in use" can be set with BIOS setup (see Chapter 4). (Do not set to the same I/O address and interrupt as those of another device.)

Set to the same values as were set during installation of the touch-panel driver software (either downloaded from the home page or purchased separately).

A set of optional driver software and utility software:
IPC-SLIB-01 (provided on a CD-ROM)
(Windows 98 Second Edition, Windows NT 4.0, and Windows 2000 for Professionals)

Table 5.29. Serial Port C I/O Addresses and Interrupts

COM	I/O address	Interrupt
1	3F8h-3FFh	IRQ 3 IRQ 4 IRQ 5 IRQ 7 IRQ 9 IRQ 10 IRQ 11 IRQ 15
2	2F8h-2FFh	
3	3E8h-3EFh	
4	2E8h-2EFh	

The BIOS defaults to the following factory settings:

```
Serial port C : COM3(3E8h-3EFh),IRQ7
```

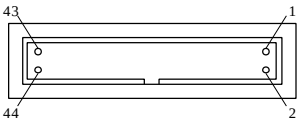
IDE Interface

Connector for the Internal Drive (Primary IDE Connector)

The BOX-PC is equipped with an E-IDE controller to allow a 2.5inch IDE hard disk to be connected to connector CN1 on the board.

Table 5.30. Primary IDE Connector (CN15)

Connector in use	44-socket header type (2mm pitch)

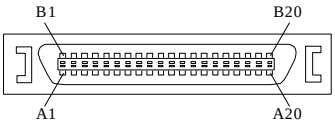


Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	RESET-	Output	2	GND	-------
3	DD7	I/O	4	DD8	I/O
5	DD6	I/O	6	DD9	I/O
7	DD5	I/O	8	DD10	I/O
9	DD4	I/O	10	DD11	I/O
11	DD3	I/O	12	DD12	I/O
13	DD2	I/O	14	DD13	I/O
15	DD1	I/O	16	DD14	I/O
17	DD0	I/O	18	DD15	I/O
19	GND	-------	20	N.C.	-------
21	DDRQ	Input	22	GND	-------
23	DIOW-	Output	24	GND	-------
25	DIOR-	Output	26	GND	-------
27	IOCHRDY	Input	28	DALE	Output
29	DDACK-	Output	30	GND	-------
31	INTRQ	Input	32	N.C.	-------
33	DA1	Output	34	N.C.	Output
35	DA0	Output	36	DA2	Output
37	CSI-	Output	38	CS3-	-------
39	DACT-	Output	40	GND	-------
41	+5V	-------	42	+5V	-------
43	GND	-------	44	N.C.	

Secondary IDE Connector-CN2

Use the dedicated option cable to connect the option CD-ROM drive.
The cable is not intended to connect devices (such as hard disks) other than CONTEC option products.

Table 5.31. Secondary IDE Connector (CN2)

Connector in use	40pin, half-pitch type (1.27mm pitch)				
					
Pin No.	Signal	Direction	Pin No.	Signal	Direction
A1	RESET-	Output	B1	GND	-------
A2	DD7	I/O	B2	DD8	I/O
A3	DD6	I/O	B3	DD9	I/O
A4	DD5	I/O	B4	DD10	I/O
A5	DD4	I/O	B5	DD11	I/O
A6	DD3	I/O	B6	DD12	I/O
A7	DD2	I/O	B7	DD13	I/O
A8	DD1	I/O	B8	DD14	I/O
A9	DD0	I/O	B9	DD15	I/O
A10	GND	-------	B10	N.C.	-------
A11	DDRQ	Input	B11	GND	-------
A12	DIOW-	Output	B12	GND	-------
A13	DIOR-	Output	B13	GND	-------
A14	IOCHRDY	Input	B14	DALE	Output
A15	DDACK-	Output	B15	GND	-------
A16	INTRQ	Input	B16	N.C.	-------
A17	DA1	Output	B17	N.C.	-------
A18	DA0	Output	B18	DA2	Output
A19	CSI-	Output	B19	CS3-	Output
A20	DACT-	Output	B20	GND	-------

Expansion Slots (CP and C4P Model)

CP model is equipped with two PCI/ISA slots to allow either a PCI or ISA bus-type board to be mounted. The C4P model has two PCI slots for accepting only PCI boards as well as two PCI/ISA slots.

Board Dimensions Allowed

Figure 5.24. Expansion Board Dimensions

Note!

A board that uses the back of the board edge connector (the shaded area in the figure) may not be mounted.

Power Supply to Expansion Slots

The following table lists the voltage that can be supplied to a board in an expansion slot and the total current capacity of all slot:

Table 5.32. Expansion Slots

<IPC-BX/M600(PCW)CP>

Voltage	Current capacity (Max.)
+5V	2A
-5V	Not supplied
+12V	0.5A
-12V	80mA

<IPC-BX/M600(PCW)C4P>

Voltage	Current capacity (Max.)
+5V	4A
-5V	Not supplied
+12V	0.5A
-12V	80mA

Note!

Make sure that the total current consumption by the boards installed in the expansion slots does not exceed the above current capacity.

Board Installation Procedure

1. IPC-BX/M600(PCW)CP

(1) Be sure the power is turned off.

(2) Remove the top cover.

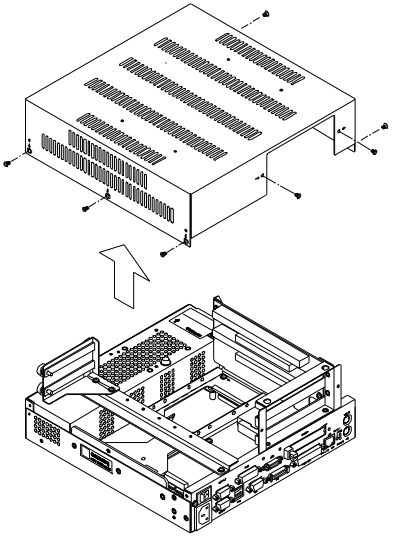


Figure 5.25. Removing the Top Cover

(3) Remove the brace that holds the printed circuit board (PCB) down.
Remove the screws on the brace. The brace will separate toward you.

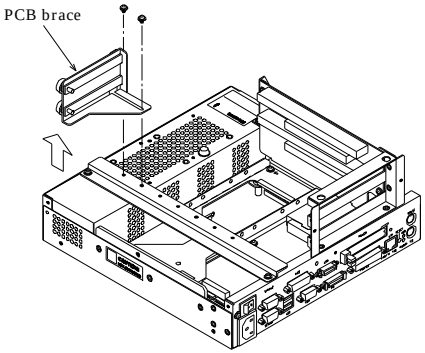


Figure 5.26. Removing the PCB Brace 2

(4) Insert the board into the slot and fasten it with screws.

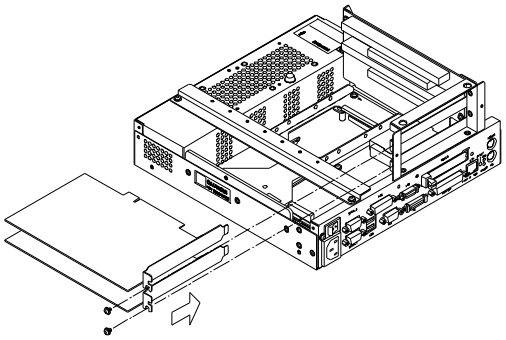


Figure 5.27. Installation of an Expansion Board

Note!

Each slot allows either the PCI or ISA board to be installed. Insert the board into the PCI connector when installing a PCI board or into the ISA connector when installing an ISA board.

(5) Install the PCB brace. It can hold down a board if its height is at least 68mm. This brace is assembled to fit the PCI card. To use it with the ISA card, rotate the claws and reinstall them.

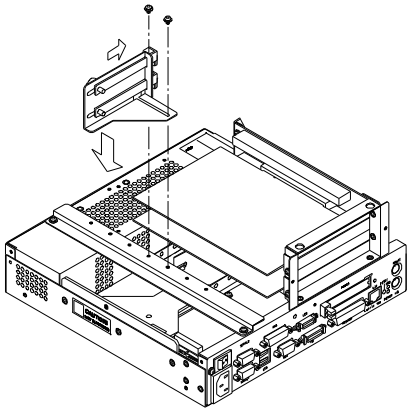


Figure 5.28. Attaching the PCB Brace

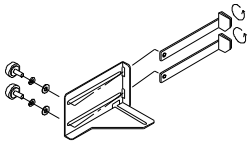


Figure 5.29. Adjusting to Use the ISA Card

(6) Replace the expansion slot cover.

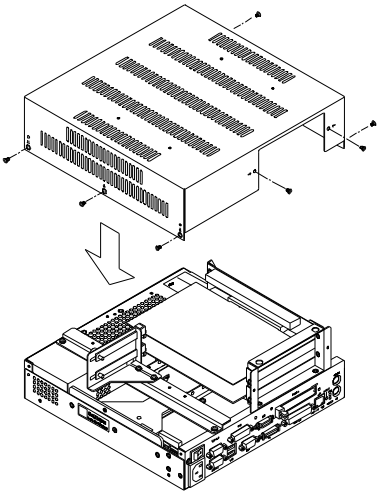


Figure 5.30. Replacing the Top Cover

2. IPC-BX/M600(PCW)C4P

(1) Be sure the power is turned off.

(2) Remove the top cover.

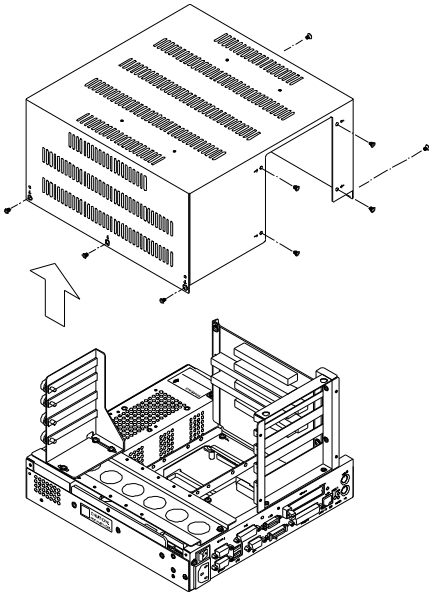


Figure 5.31. Removing the Top Cover

(3) Remove the brace that holds the printed circuit board (PCB) down.
Remove the screws on the brace. The brace will separate toward you.

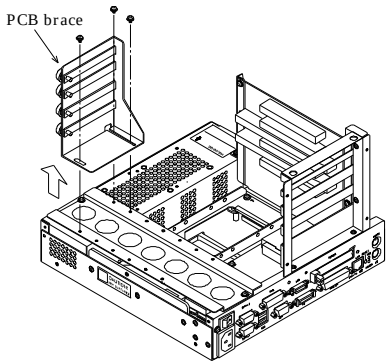


Figure 5.32. Removing the PCB Brace 2

(4) Insert the board into the slot and fasten it with screws.

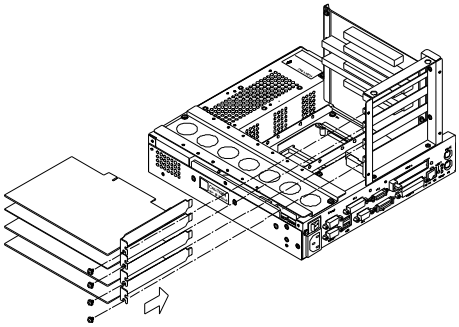


Figure 5.33. Installation of an Expansion Board

Note!

The upper two slots accept only PCI boards while the lower two accept either PCI or ISA boards.

Insert the board into the PCI connector when installing a PCI board or into the ISA connector when installing an ISA board.

(5) Install the PCB brace. It can hold down a board if its height is at least 68mm. This brace is assembled to fit the PCI card. To use it with the ISA card, rotate the claws and reinstall them.

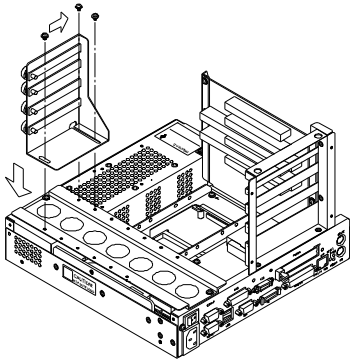


Figure 5.34. Attaching the PCB Brace

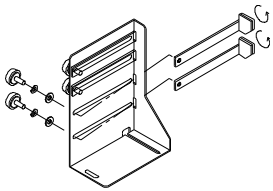


Figure 5.35. Adjusting to Use the ISA Card

(6) Replace the expansion slot cover.

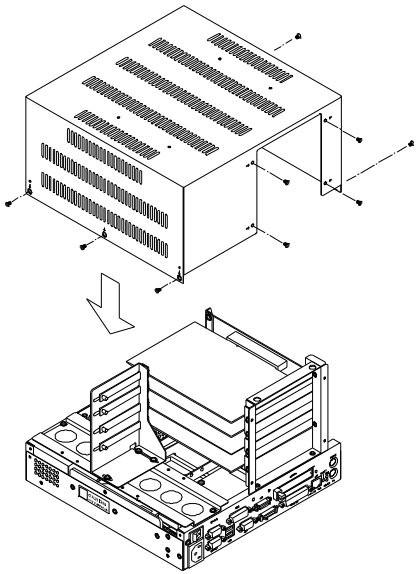


Figure 5.36. Replacing the Top Cover

6. Appendix

Memory Map

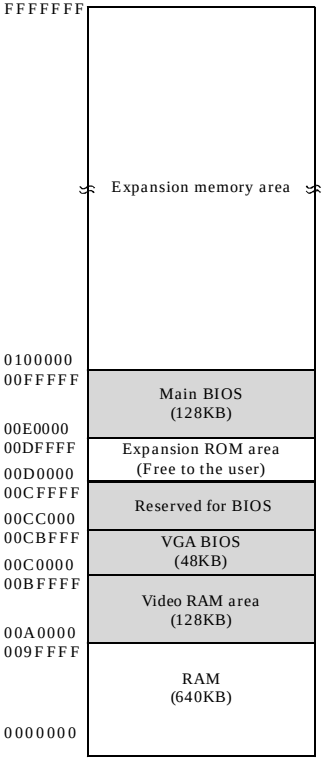


Figure 6.1. Memory Map

I/O Port Addresses

Table 6.1. I/O Port Addresses

ADDRESS(HEX)	Description	Remark
000-00F	DMA controller 1 (slave)	ch0-3 (8-bit transfer)
010-01F	Reserved for system	
020-03F	Interrupt controller 1 (master)	
040-05F	Timer	
060-06F	Keyboard controller	
070-07F	RTC, NMI mask	
080-09F	DMA page register	
0A0-0BF	Interrupt controller 2 (slave)	
0C0-0DF	DMA controller 2 (master)	ch5-7 (16-bit transfer)
0E0-0FF	Reserved for system	
100-12F	Available to user	Available to expansion bus (CP and C4P models)
140-16F	Available to user	Available to expansion bus (CP and C4P models)
170-17F	IDE hard disk controller	Secondary
180-18F	Reserved for system	
190-1DF	Available to user	Available to expansion bus (CP and C4P models)
1E8-1EF	Reserved for system	
1F0-1FF	IDE hard disk controller	Primary
200-277	Available to user	Available to expansion bus (CP and C4P models)
278-27F	Reserved for parallel port	LPT2
280-2E7	Available to user	Available to expansion bus (CP and C4P models)
2E8-2EF	Reserved for serial port	COM4
2F0-2F7	Available to user	Available to expansion bus (CP and C4P models)
2F8-2EF	Serial port	COM2
300-35F	Available to user	Available to expansion bus (CP and C4P models)
370-375	Reserved for system	
376-377	IDE hard disk controller	Secondary
378-3AF	Reserved for parallel port	LPT1
3B0-3BB	Reserved for system	
3BC-3BF	Reserved for parallel port	LPT3
3C0-3DF	Reserved for system	
3E0-3E7	PCMCIA	C, CP and C4P models
3E8-3EF	Serial port	COM3 (Touch panel, Default factory setting)
3F0-3F7	FD controller	
3F8-3FF	Serial port	COM1
4D0-4DF	Reserved for system	
CF0-CFF	Reserved for system	
4000-4007	RAS functions	
4008-400F	Reserved for system	
46E8	Reserved for system	
83D0-B3D3	Reserved for system	

Interrupt Level List

Table 6.2. Hardware Interrupt Levels (Factory Settings)

Type	8259	Priority	Description	Vector	Remarks
NMI		High	I/O CH CK or WDT	02H	
IRQ0	MASTER	↑	Timer 0	08H	
IRQ1	"	|	Keyboard	09H	
IRQ2	"	|	Interrupt controller 2 (slave)	0AH	
IRQ8	SLAVE	|	Real-time clock	70H	
IRQ9	"	|	Not in use	71H	Available to user
IRQ10	"	|	Not in use	72H	Available to user
IRQ11	"	|	Reserved for PCI device	73H	
IRQ12	"	|	Reserved for PS/2 mouse	74H	
IRQ13	"	|	Reserved for coprocessor	75H	
IRQ14	"	|	Reserved for hard disk	76H	Primary
IRQ15	"	|	Reserved for optional CD-ROM	77H	Secondary
IRQ3	MASTER	|	Serial port B (COM2)	0BH	
IRQ4	"	|	Serial port A (COM1)	0CH	
IRQ5	"	|	Not in use	0DH	Available to user
IRQ6	"	↓	Reserved for floppy disk	0EH	
IRQ7	"	Low	Serial port C (touch panel)	0FH	Touch panel (Default factory setting)

* Do not use for ISA devices.

7. List of Options

Memories (144pin SO-DIMM)

- PC-MSD64-144H 64MB SD memory module
- PC-MSD128-144H 128MB SD memory module

Hard disk (IDE 2.5inch)

- PC-HDD20G 20GB Hard disk

Silicon disk (IDE 2.5inch)

- PC-SDD500H 512MB Flash silicon disk
- PC-SDD1000H 1GB Flash silicon disk
- PC-SDD2000V 2GB silicon disk drive

Floppy disk drive

- PC-FDD25BH 3.5inch floppy disk drive (comes with a cable)

(Note: Required to install the LAN driver.)

Terminal block for connecting the RAS connector

- IPC-PSD-20 Terminal block for connecting the RAS connector

TFT color liquid-crystal display

< Analog RGB/DVI-D types>

- IPC-DT/S61VT-DC1 (6.5inch 640 x 480 dots, Panel mounted type)
- IPC-DT/S65VT-DC1 (6.5inch 640 x 480 dots, Embedded type)

<Panel Link types>

- IPC-DT/H40X(PC)T (15.0inch 1024 x 768 dots, Panel mounted type)
- IPC-DT/L40S(PC)T (12.1 inch 800 x 600 dots, Panel mounted type)
- IPC-DT/L440(PC)TA (12.1 inch 800 x 600 dots, Desktop/wall-mounted)
- IPC-DT/L440(PC)TB (12.1 inch 800 x 600 dots, Desktop/wall-mounted, anti-glare type)

<Analog RGB types>

- IPC-DT/M20V(PC)T (10.4inch 640 x 480 dots)
- IPC-DT/L20S(PC)T (12.1inch 800 x 600 dots)
- IPC-DT/H20X(PC)T (15inch 1024 x 768 dots)

PanelLink-DVI-D conversion cable

- IPC-PLDVI-020 PanelLink-DVI-D conversion cable (2m)
- IPC-PLDVI-050 PanelLink-DVI-D conversion cable (5m)

Display cable only for PanelLink

- IPC-PL2020-020 Display cable (2m)
- IPC-PL2020-050 Display cable (5m)

Touch-panel cable for an analog RGB display

- IPC-CBL3-2 AT host Touch panel, COM cable (2m)
- IPC-CBL3-5 AT host Touch panel, COM cable (5m)

CD-ROM/ DVD-ROM drive

- IPC-CDD-02 CD-ROM/ DVD-ROM drive

Driver

- IPC-SLIB-01 * Driver & Utility Soft Set (CD-ROM version)

* You can download the driver from the Download Library (http://www.contec.com/download) on the CONTEC web site. If you need IPC-SLIB-01 (CD-ROM version), it is available as a separately priced option.

IPC-BX/M600(PCW)
IPC-BX/M600(PCW)C
IPC-BX/M600(PCW)CP
IPC-BX/M600(PCW)C4P

User's Guide

IPC-BX/M600(PCW)-HMU

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February 2004 Edition

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Management No. A-46-469
Parts No. LZT9021